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CES-MED

CLEANER ENERGY SAVING MEDITERRANEAN CITIES

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Israel
Municipality of Rosh HaAyin Sustainable Energy Action Plan (SEAP)

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Sustainable energy action plan (SEAP)

Municipality of Rosh HaAyin

- Israel –

Integral document of the sustainable energy action plan

With special thanks to: Dr. Shalom Ben Moshe – Mayor of Rosh Ha'ayin
Mr. Shlomo Gispan – head of maintenance and appearance wing (SH.F.A.)
Ms. Dafna Lavi – head of environment and recycling dpt.
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For their help and commitment to the fulfilment of this project's needs.

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Executive Summary

Israel has been characterized many times in the past as an energy island, due to the unique challenges the country is facing. The Ministry of National Infrastructures, Energy and Water Resources (MIEW) in Israel, deeply acknowledging this situation is collaborating with the "Cleaner Energy Saving Mediterranean Cities CES – MED" project to support selected municipalities in Israel in their effort towards energy sustainability.

The Municipality of Rosh HaAyin (RHA) is located in the central district of Israel, consisting of approximately 40,600 citizens according to data by the Central Bureau of Statistics (CBS) for 2012. The municipality's population is solely Jewish.

During the SEAP implementation, the Municipality of Rosh HaAyin is going to work closely with the rest of the Israeli Municipalities that are members of the CoM, as well as the Tag HaSviva Programme and the respective Ministries. The municipality has already implemented an extended adaptation of its administrative structures to support the SEAP implementation and to monitor the status of the program.

The Mayor's plan in sight of the new neighbourhood being built and the doubling of the city's population in the coming years is to render Rosh HaAyin a green city with sustainability, good transportation and more, ensuring its citizens' good quality of life.

The total target of the SEAP implementation is to reduce the Carbon footprint of the Municipality with a reduction of 73,963.67 tn CO_2 by 2020, which is 20% of the municipality's BAU total emissions.

For the implementation of the SEAP the total budget is around 555 million NIS, of which 450.45 million NIS is expected to be mobilised from private funds. Out of the remaining 104.55 million NIS, the Municipality of Rosh HaAyin will contribute with around 10%, while the rest of the financial needs of the SEAP will be fulfilled from EU Funding Schemes, the Israeli Government and the Ministries of Finance and Environment.

According to the CoM Guidelines, the year 2011 was selected as the baseline year, because the data from this year are complete and reliable.

The Municipality of Rosh HaAyin included in the Baseline Emissions Inventory all the compulsory sectors and three optional ones:

- Municipal Buildings / Equipment / Facilities;
- Tertiary (non Municipal) Buildings / Equipment / Facilities;
- Residential Buildings;
- Public Lighting;
- Transport (Municipal / Public / Private);
- Industry;
- Agriculture;
- Solid Waste Treatment.

For the Baseline Emissions Inventory, the IPCC emission factors have been adopted for all fuel types in accordance to the CoM Guidebook, except from electricity, where the local emission factor from the Israeli Electricity Company (IEC) was used. Moreover, the conversion rates utilized, wherever applicable, were according to the JRC guidelines for Southern Municipalities, the 2006 IPCC Guidelines and the CoM Guidebook for the European Municipalities. Finally, the Solid Waste

Management sector's emissions were calculated according to the IPCC default method for the Methane (CH_4) emissions that are produced from the landfilling process.

The energy consumption occurs mainly from three sectors, namely Commercial Buildings, equipment and facilities, Residential buildings and Private and commercial transport. The total energy consumption in the Municipality of Rosh HaAyin is presented in the following spider chart.

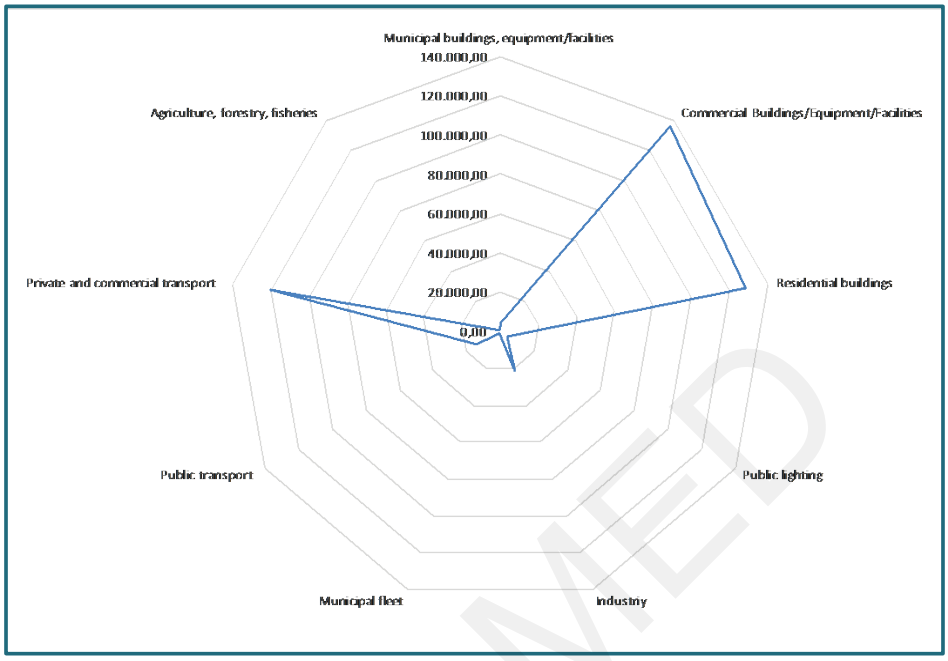

Figure 1 - Energy Consumption per sector

The **Agricultural Sector** has a very small electricity consumption, based on data by the IEC.

The Municipal Buildings and Facilities Sector includes all the structural and municipal offices, the educational buildings, clubs and shelters, sports halls and culture and community structures, with their relevant consumptions being available from the IEC. There are no public water pumping facilities, as they are undertaken by a private company. Most of the electricity consumption of the Municipal buildings is attributed to the operation of the educational buildings.

As far as the **Municipal Lighting Sector** is concerned, the electricity consumption comes from the street lighting and traffic lights. The majority of the consumption belongs to the street lighting, with a dominating 99.5%. There are no lighted parking lots in the municipal area.

The total energy consumption in the **Residential Buildings Sector** comes from three different sources, namely electricity, liquefied petroleum gas (LPG) and solar thermal facilities. The data for this sector were available from the IEC, the local gas company's (Pazgaz) average consumptions, and studies on the solar water heating facilities in Israel. The allocation of the consumptions in the Residential sector is presented in the following figure:

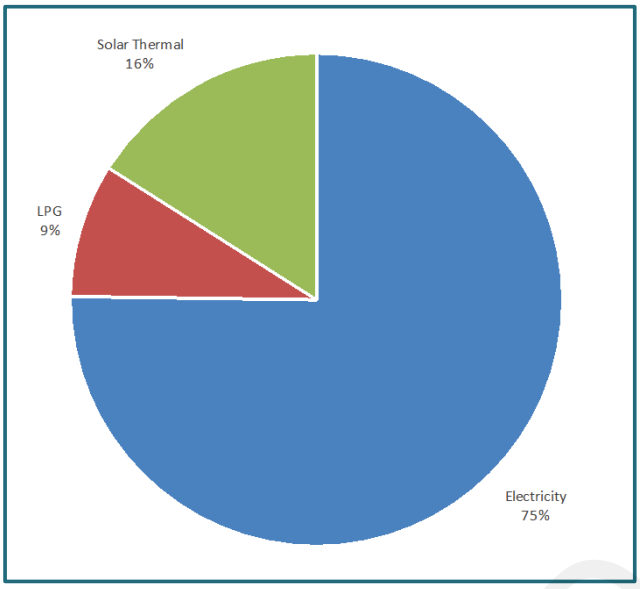

Figure 2 - Energy sources in the Residential Sector

The **Commercial Buildings, Equipment and Facilities Sector** consumes electricity from the Israeli Electricity Company. Almost 98% of the total consumption comes from the commercial buildings, with the water pumping facilities consuming the rest.

The **Industrial Sector** includes electricity consumptions from small – medium companies, as well as few large industries. Their consumption data for 2011 was provided by IEC.

Regarding the **Transport Sector**, emissions in the BEI occur from the Public and Private transport sections.

- The ***municipal fleet*** consists of passenger vehicles and small pickup trucks that consume Gasoline and Diesel respectively. The allocation of the fuel used from the municipality for its own fleet is shown in the pie chart below.

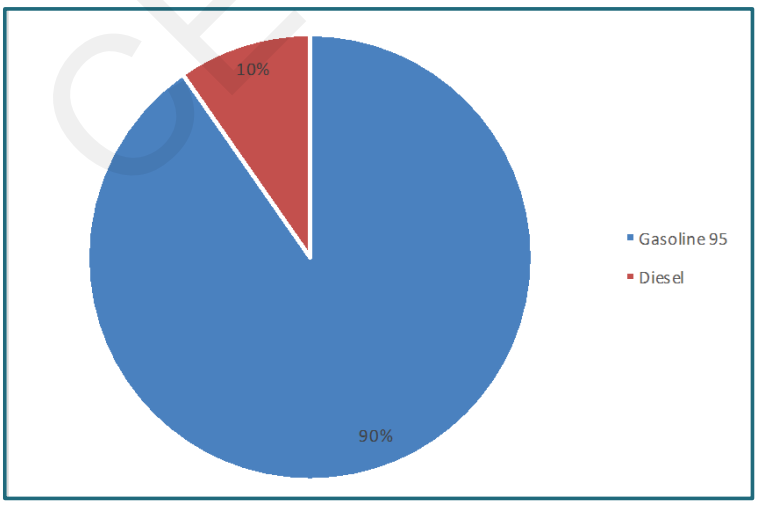

Figure 3 - Municipal Fleet Fuel Consumption

- Consumptions from ***public transport*** were not directly available from the company serving the area and an approach utilized included calculation of the total distance travelled within the local authorities' area from the public buses and the average consumptions for buses that were available from the Israeli Central Bureau of Statistics (CBS).
- The ***private and commercial transport*** section includes private cars, motorcycles, taxis, trucks, minibuses and buses, which were available from the municipal records. The approach utilized was based on the average distance that each vehicle type covers within a year, available from the Israeli CBS for 2011. Also, relevant studies by the Technion University on the distances travelled within the local authorities' area were used.

There are no local electricity production facilities or heating / cooling production installations in the Municipality of Rosh HaAyin.

As far as the **Solid Waste Management** emissions are concerned, there are two types of waste management, landfill and recycling. The data was available from the municipal personnel. The amount of waste that is recycled is 8.8%, while the rest is landfilled.

The **total emissions for the Rosh HaAyin Municipality** are presented in the following table.

Table 1 - Baseline Emission Inventory Summary (tn CO_2)

Sector of energy consumption	Electricity	Liquid Gas	Diesel	Gasoline	Solar Thermal	TOTAL
	tn CO_2					
Agriculture	564.01					564.01
Municipal Buildings/Equipment/Facilities	3,335.55					3,335.55
Public Lighting	3,232.32					3.232,32
Residential Buildings	70,870.69	2,567.69			0.00	73,438.38
Commercial Buildings/Equipment/Facilities	99,897.72					99,897.72
Industry	15,473.10					15,473.10
Municipal Transport			25.38	202.91		228.30
Public Transport			3,696.75			3,696.75
Private transport			9,387.50	17,653.10		27,040.60
Solid Waste Management						9,009.00
TOTAL	**192,899.38**	**2,567.69**	**13,109.63**	**17,856.01**	**0.00**	**236,005.71**

The municipality's representatives, through the BEI identification, acknowledged the most significant sectors affecting their carbon footprint. The commercial buildings and the residential buildings are the most emitting sectors.

However, the municipality faces a unique challenge until 2020. The new neighbourhoods planned are expected to double the city's residents by that year, impacting in this way on the whole city's consumptions and especially those related to the residential, tertiary and transport sectors.

In this respect, the use of the national coefficient for Israel (k = 1.27) for the selected baseline year under the Business as Usual (BAU) scenario suggested by the JRC Guidelines for South Municipalities is not considered appropriate to cover this magnitude of population increase in such a short period of time. In this respect, two different scenarios are studied:

- Development of a no-actions scenario, as a modified BAU scenario, in an effort to estimate the municipality's consumptions in 2020, in case that no measure to curtail the energy consumption growth is taken.
- Setting per capita reduction targets.

After the study of the two different scenarios, the no-actions scenario is considered to be more realistic and the planned actions are based on the results of this modified BAU scenario. According to this scenario, the emissions of the Municipality of Rosh HaAyin are expected to reach 369,518.54 tn CO_2 in the year 2020.

The actual emission reduction target undertaken by the Municipality of Rosh HaAyin is 20%, namely 73,963.67 tn CO_2. Each sector's contribution is shown in the following pie chart.

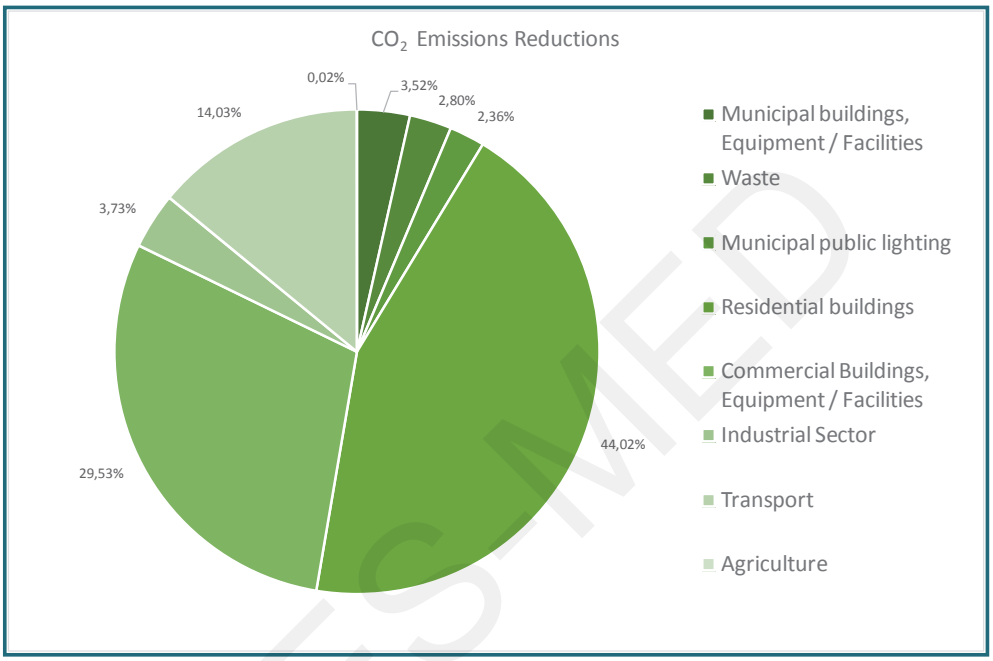

Figure 4 - Contribution per sector to the total CO_2 emission reduction

The calculation of all emission reductions for the suggested actions in 2020 is calculated with the emission factor for electricity being 0.60 tn/MWh in 2020, due to the foreseen increased penetration of natural gas in the electricity generation mix.

The Municipality of Rosh HaAyin has planned a set of actions for each sector. The actions consist of both awareness raising activities for the different stakeholders and the public, and of actions related to energy efficiency and energy production. The awareness raising activities are expected to have a significant contribution to the reduction of the carbon footprint, including actions on waste (reduction of the organic content of waste).

As far as the energy efficiency is concerned, substitution of old electrical devices is included in the proposed actions for the Municipal and Residential Buildings, while the initiative "10% Voluntary Commitment Campaign" is proposed for all sectors to reduce their energy consumptions at an annual basis. In addition, the installation of Photovoltaics on the rooftops of the Municipal, Residential and Commercial buildings will be promoted, in order to reduce the electricity consumed from the grid and take advantage of the high solar potential the southern municipalities have.

A total list of actions is provided in the following table.

Table 2 - Summary of SEAP Actions

Action No	Action	Energy Savings (MWh)	Emission Reductions (tn CO_2)	Cost (NIS)
Municipal buildings, Equipment / Facilities				
1.1	Green procurement procedures for municipal buildings	223.00	133.80	300,000.00
1.2	Upgrading the municipal buildings' A/C and lighting systems	1,850.07	1,110.04	2,500,000.00
1.3	Energy Manager appointment in the Municipality	41.30	24.78	500,000.00
1.4	Energy refurbishment of selected municipal buildings as pilot projects	180.00	108.00	3,500,000.00
1.5	Use of cool colours in municipal buildings' roofs	412.96	247.78	275,000.00
1.6	Awareness raising activities for municipal employees	165.18	99.11	100,000.00
1.7	The 10% commitment campaign for schools	505.70	303.42	100,000.00
1.8	Awareness raising campaigns for pupils/ students	126.43	75.86	100,000.00
1.9	Promotion of recycling		1,441.44	3,500,000.00
1.10	Awareness raising campaigns to reduce the amounts of discarded food (reduction of the organic content of waste)		698.00	200,000.00
1.11	Installation of 700 kW PVs in municipal buildings' rooftops	840.00	504.00	6,000,000.00
Municipal public lighting				
2.1	Municipal lighting study	0.00	0.00	100,000.00
2.2	Municipal lighting system upgrade	2,489.00	1,493.40	9,540,300.00
Residential buildings				
3.1	The 10% voluntary commitment campaign	19,143.79	11,486.27	750,000.00
3.2	Promotion of Green Buildings' concept	10,635.44	6,381.26	69,250,000.00
3.3	Campaign for substitution of old A/Cs and lamps	9,276.00	5,565.60	13,300,000.00
3.4	Information & awareness raising activities	6,487.62	3,892.57	150,000.00
3.5	Initiatives supporting citizens' actions	2,127.09	1,276.25	75,000.00
3.6	Establishment of the municipal team	3,190.63	1,914.38	1,750,000.00
3.7	3 MW Photovoltaic panels in residential rooftops	3,600.00	2,160.00	25,100,000.00
Commercial Buildings, Equipment / Facilities				
4.1	Seminars to professional groups	2.250,75	1,350.45	2,350,000.00
4.2	10% voluntary commitment campaign	13.504,48	8,102.69	700,000.00
4.3	Promotion of green buildings' concept	9.002,99	5,401.79	10,650,000.00
4.4	Other information and awareness raising activities	4.501,49	2,700.90	100,000.00
4.5	6 MW photovoltaic panels on building rooftops	7.200,00	4,320.00	50,050,000.00
Industrial Sector				
5.1	Subsidized energy audits at a volunteer basis	1.393,21	835.93	2,150,000.00
5.2	Targeted training seminars	464,40	278.64	120,000.00
5.3	10% voluntary commitment campaign	1.393,21	835.93	120,000.00
5.4	Switch to "cleaner" electricity provider	2.322,02	813.40	0.00
Transport				
6.1	Replacement of the municipal vehicles with new and more efficient	73.50	18.42	1,620,000.00
6.2	Efficient management of the municipal fleet	30.03	7.53	80,000.00
6.3	Maintenance of the municipal fleet	65.06	16.32	200,000.00
6.4	Eco-driving seminars for the municipal fleet's drivers	100.10	25.11	150,000.00
6.5	Awareness raising on new vehicle technologies	14,290.94	3,634.09	275,500,000.00
6.6	Transportation master plan	0.00	0.00	500,000.00
6.7	Increase the frequency of public transport routes	4,729.54	1,177.66	50,000.00
6.8	Cycling promotion and creation of related infrastructure	5,675.45	180.00	60,850,000.00
6.9	Promotion of walking, car sharing and car pooling campaigns	3,310.68	824.36	2,000,000.00
6.10	Adoption of real time information in public transport	2,837.73	400.00	450,000.00
6.11	Eco-driving promotion for professionals in private transportation	5,419.43	1,410.35	1,500,000.00
6.12	Promotion of new technology buses in the public transportation	3,427.02	915.02	8,500,000.00
6.13	Traffic congestion reduction through adoption of different timing of activities	6,124.69	1,782.62	150,000.00
Agriculture				
7.1	Awareness raising activities	27.51	16.50	40,000.00
TOTAL		**149,438.43**	**73,963.66**	**554,920,300.00**

Chapter 1 : Overall Strategy

1.1 Rosh HaAyin 2020 Targets

Israel has been characterized many times in the past as an energy island, due to the unique challenges the country is facing. The large natural gas reserves recently identified and utilized will certainly decrease the country's dependence on external energy resources, but this still does not suffice. More actions need to be taken towards this direction in order to come closer to the self-sufficiency target.

The Ministry of National Infrastructures, Energy, and Water Resources (MIEW) in Israel, deeply acknowledging this situation is collaborating with the "Cleaner Energy Saving Mediterranean Cities - CES MED" project, financed under the EUROPAID Programme, to support selected municipalities in Israel in their effort towards energy sustainability.

The Municipality of Rosh HaAyin (RHA) is located in the central district of Israel, consisting of approximately 40,600 citizens according to data by the Central Bureau of Statistics (CBS) for 2012. The municipality's population is solely Jewish.

The Mayor of Rosh HaAyin, along with the council members, agreed to the adherence to the Covenant of Mayors in March 2014, committing to a reduction of the municipality's GHG emissions by at least 20%. The municipality of Rosh HaAyin was the third one at the country level to join the CoM and has been also participating in the Israeli Initiative Tag HaSviva.

The overall target being set by the municipality for 2020 is 20%, placing emphasis on working closely with all community actors. The municipality will take all necessary measures on its facilities, establishing a good paradigm for the community, while it will place a lot of emphasis on collaborating with the public and achieving significant reductions from the residential, tertiary and transport sectors, with waste being also a priority for the local administration.

1.2 Current Status

1.2.1 Geographical location and sites.

Rosh HaAyin is a city in the Centre District of Israel, located 10 kilometres from Tel Aviv. To the west of the municipality are located the fortress of Antipatris and the source of the Yarkon River. To the southeast is the fortress of Migdal Afek (Migdal Tzedek). The city is located near the origin of the Yarkon River and from there the city got its name: Rosh- head Ayanot (HaAyin) – water springs.

The size of the city is about 24,390 km^2. Its eastern neighbourhoods are bordering the "green line", which is the Israeli border before the 1967 war, when west bank was conquered by Israel.

A map of the territory is provided in the figure on the next page.

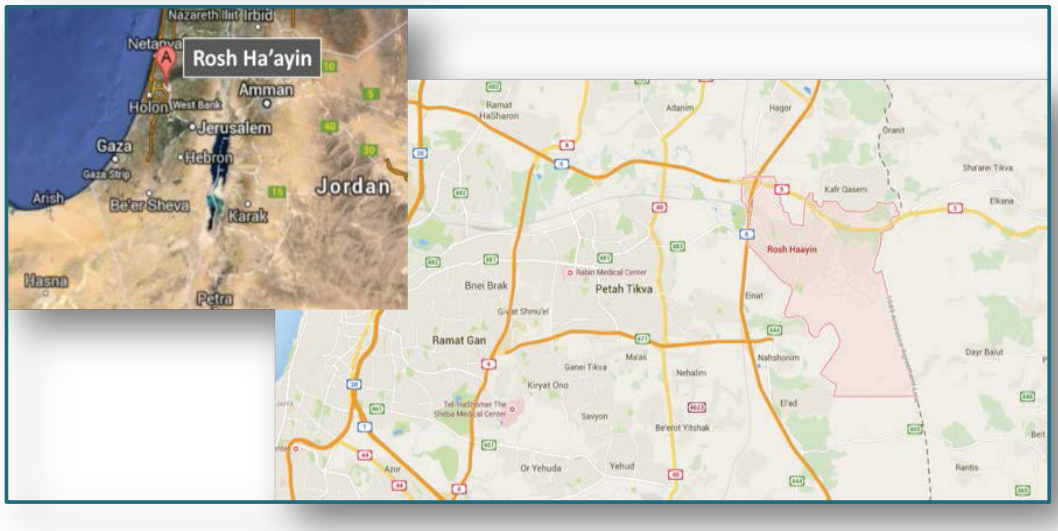

Figure 5 – Rosh HaAyin Municipality

In and around Rosh HaAyin there are many archaeological sites, some of which are mentioned indicatively below:

- Kesem cave;
- Antipatris fort; and
- Afek tower.

In addition, there are nature sites such as the origins of the Yarkon river, Rabba stream and Rosh HaAyin woods.

In the beginning of the 20th century, during the British Mandate, a railway was built (1917-18) which was of great significance in moving the supplies for the British army. Next to the railway station, the British built a big army camp with storage for ammunition. The train came from Egypt, through Israel to Syria and Lebanon. Today the old British buildings are still standing.

Some indicative photos from the municipality are presented in the following figure.

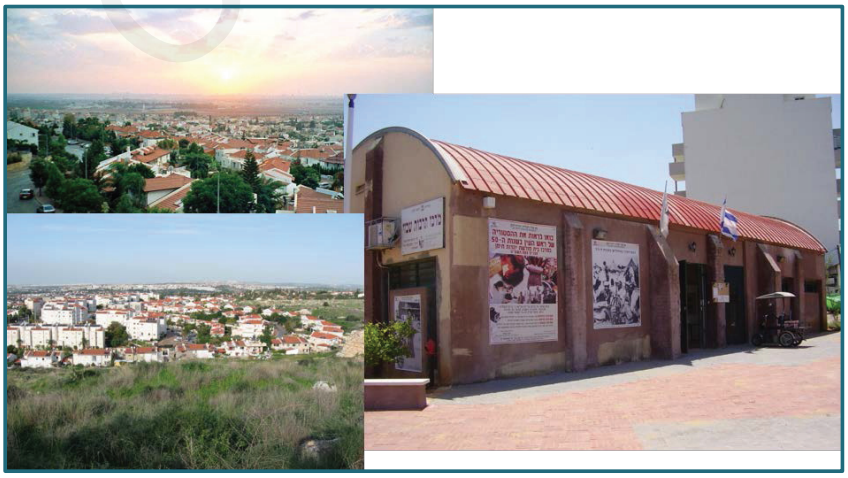

Figure 6 - Rosh HaAyin Municipality in pictures

1.2.2 Demographic tendencies

The Municipality of Rosh HaAyin was established in 1949 and declared as a city in 1994. Many of the early residents were Yemenite Jews (from Yemen) who were airlifted to Israel in the "Operation Magic Carpet". The operation was very impressive – 430 flights brought 47,000 Jews from Yemen during the 18 months from May 1948 until September 1949.

In the 1990s new neighbourhoods were built, with most of the new citizens being army veterans from relatively high socio-economic level, young couples and new immigrants from the former USSR. As a result, the town tripled its size. Further development is planned by 2025, with the city believed to reach 100,000 citizens, doubling its current size.

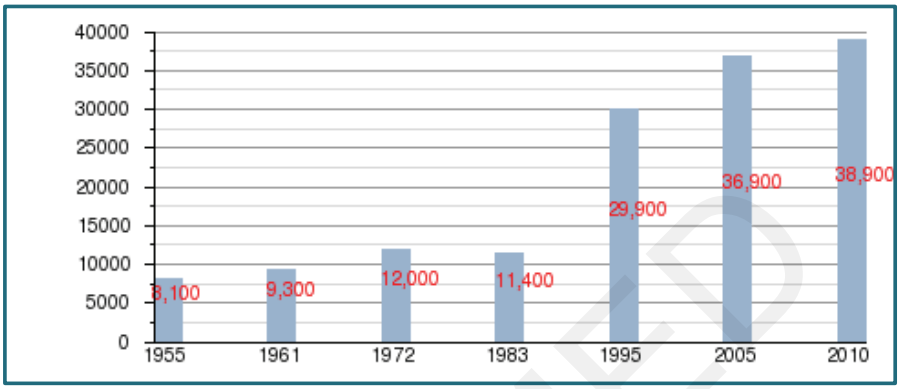

Figure 7 –Demographic tendencies in Rosh HaAyin

1.2.3 Climate characteristics

The temperatures are pleasant, with relatively small differences between minimum and maximum temperatures. The lowest daily average is observed in January and it is 13°C, while the highest one can reach up to 27°C and is observed in August. In the summer there is medium heat load with humidity around 65%. The average rainfall is 530-570 mm per year (only in the winter), with yearly dew of 100 mm.

Table 3 – Min/Max temperatures for Rosh HaAyin

Month	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Max	18.2	18.9	21.2	24.4	27.3	29.6	31.5	31.8	30.8	28.4	24.8	20.3
Min	7.8	8.2	10.1	12.9	16.1	19.6	22.3	22.8	20.9	17.5	12.8	9.7
Daily ave	13.0	13.5	15.6	18.7	21.7	24.6	26.9	27.3	25.9	23.0	18.8	15.0

In the figure below, the maximum daily average (Red), minimum daily average (Blue) and Daily average (Green) are presented. In addition, the monthly maximum (Purple diamond) and minimum (light blue diamond) can be seen. Temperatures are given in Celsius (Y axis), and Months (X axis).

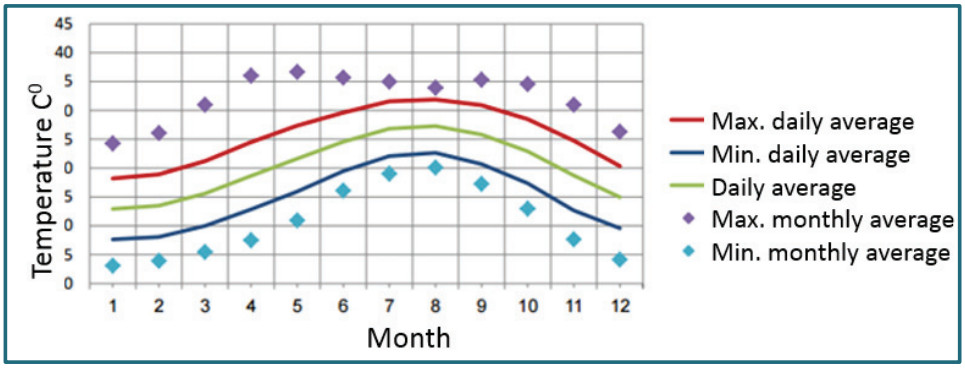

Figure 8 –Temperature fluctuation in the region

1.2.4 Employment

The total number of employees (salary and self-employed) according to CBS data for 2012 was 20,339 persons, namely a little over 50% of the total population. About 33% of these employees earn less than the minimum wage, with the discrepancies between men and women being vast. The Socio-Economic rating is medium: 6 (on a scale from 1-10, 1 being the lowest).

1.2.5 Existing Infrastructure

The total number of registered households is 10,820, most of them privately owned; currently there is a total of 108 buildings being built and another 55 near completion. There is a mixture of low height (1-2 stories) family owned "cottages", and relatively low high-rise buildings, usually between 4-8 stories high. Because of relative land scarcity, and large number of apartments being planned, the new neighbourhoods are expected to have mostly high-rise buildings.

There are public busses in town with a few routes planned. The public buses company will change in 2016, while the new company has more technologically advanced buses and is planning more routes. There are 13,031 privately owned cars, with an average age of 7 years.

1.2.6 Complementarity with Municipal plans and other related actions

There are a number of ongoing actions complementary or related to the SEAP.

The first one is the municipality's participation in the Tag HaSviva program. The municipality, already before its CoM adherence, was participating in this initiative and was monitoring the consumptions from the municipal buildings and facilities. Participation in the CoM and SEAP elaboration provides the municipality with a greater overview of the whole region's consumptions and a key role to realise activities in all directions envisaged. Monitoring the SEAP progress and the actions realized is a significant tool in the hands of the municipality for the Tag HaSviva program as well.

The second one relates to the undertaking of a new company for the public transportation. According to a representative of "Afikim" company, the plan is to have 250 buses operational by the end of 2016. More importantly, the routes and operation hours will be enhanced, with an estimated increase of the population using the buses of up to 50%. A significant part of this upgrade consists of connecting the city to the train station in the peak hours in short and fast lanes, lines to the industrial (occupation) zone, new lines within the city, increase frequency of lines going from Rosh HaAyin to Tel-Aviv and a new line from Rosh HaAyin to the industrial (occupation) zone in Petah Tikva (the adjacent city). Lines will be added to Jerusalem and to additional cities to the north of Rosh HaAyin.

The company's fleet of busses is very advanced, with personal systems for each passenger – USB, Wi-Fi, advanced technology for accident prevention, spacious seats, accessibility, voice systems

calling the next stations inside and outside the busses and more. In the bus stops there will be electronic signs updating the passengers on the arrival times of the next bus. Furthermore, the company is planning a "one stop shop" for tickets.

The most significant plan however concerns the development of a new neighbourhood by 2025, which is expected to double the municipality's current size, reaching up to 100,000 citizens.

1.2.7 Complementarity with national actions

The decision for the municipality's adherence to the Covenant of Mayors is in line with the National Energy Efficiency Programme, which promotes the target of reducing electricity consumption between the years 2010 – 2020 by 20%, in order to decrease a state of chronic shortages. The programme started with a 200-250 million Shekel budget, approximately 42-52.5 million Euros, which is not enough to cover all the activities envisaged in its duration. In order to attain the necessary financial sources for the overall implementation of the efficiency programme, the National Recommendations Report requires establishing an energy efficiency fund. The programme approaches and examines each sector (household, industrial, commercial and public, LAs, new buildings, and agriculture) to determine where energy savings opportunities exist.

Although this national programme does not directly fund projects, it is the guide for all smaller MIEW budgeted programmes, which are directly connected to the national programme and concern energy efficiency actions in municipal buildings and facilities.

Another complementarity with a national action is the Tag HaSviva programme, which aims to improve efficiency in the consumption of energy resources, with an emphasis on electricity consumption, waste and water. The programme was launched in 2010 as a joint venture of the Federation of Local Authorities in Israel (FLA) and the Ministry of Environmental Protection (MEP) with direct collaboration with the Israel Energy Forum and the Heschel Sustainability Centre. The programme's aim is to promote streamlining processes and save resources while achieving economic gain for the local authority's budget. The programme was based in part on the European model of Local Governments for Sustainability (ICLEI) and received European funding as well as Israeli governmental funding. The clear and central goal of the Tag HaSviva is to help Israel come closer to 20% reduction in CO_2 emissions by 2020 by implementing an environmental efficiency programme at LAs not included in Forum 15.

1.3 Vision for the future

The Mayors' vision for the future of Rosh HaAyin is a city on the verge of unprecedented growth. The city is growing fast, a process bringing much development and refurbishment both to the existing neighbourhoods, and to the new areas being built.

Today Rosh HaAyin accommodates approximately 42,000 citizens, and in the coming years the city will have thousands of new families joining, thus reaching 100,000 citizens. The Municipality of Rosh HaAyin plans to improve the citizens' quality of life, while maintaining the social and community structures. The new neighbourhoods will be smart and responsible and will only add to the existing parts of the city.

As stated by the Mayor: "Rosh HaAyin is located on a central cross road in the heart of the country, and is a leading city with an advanced education system, rich and diverse cultural and sports activities, from the very young children up to the elderly. Rosh HaAyin has been and shall continue to be a green city with sustainability, good transportation and excellent education."

1.4 Organizational and financial aspects

1.4.1 Coordination with national and local authorities

During the SEAP implementation, the municipality of Rosh HaAyin is going to work closely with the rest of the Israeli municipalities that are members to the CoM, as well as the Tag HaSviva Programme and the respective ministries.

1.4.2 Adaptation of administrative structures

The Municipality of Rosh HaAyin realized an extended adaptation of its administrative structures in order to be able to fulfill the needs of the SEAP and implement all the proposed actions and measures.

The Organogram of the Municipality of Rosh HaAyin is shown in the next figure. The green section is the “Engineering wing” of the Municipality, which will play an important role in the completion of the SEAP targets, with both resources and man-power.

The core team for the SEAP’s elaboration consists of

- Mr. Shlomo Gispan – head of maintenance and appearance wing (SH.F.A.)
- Ms. Dafna Lavi – head of environment and recycling dpt. (under SH.F.A.)
- Mr. Danny Golbary – business registration dpt. (under SH.F.A.)
- Mr. Danny Levy – Electricity dpt. (Under infrastructure).

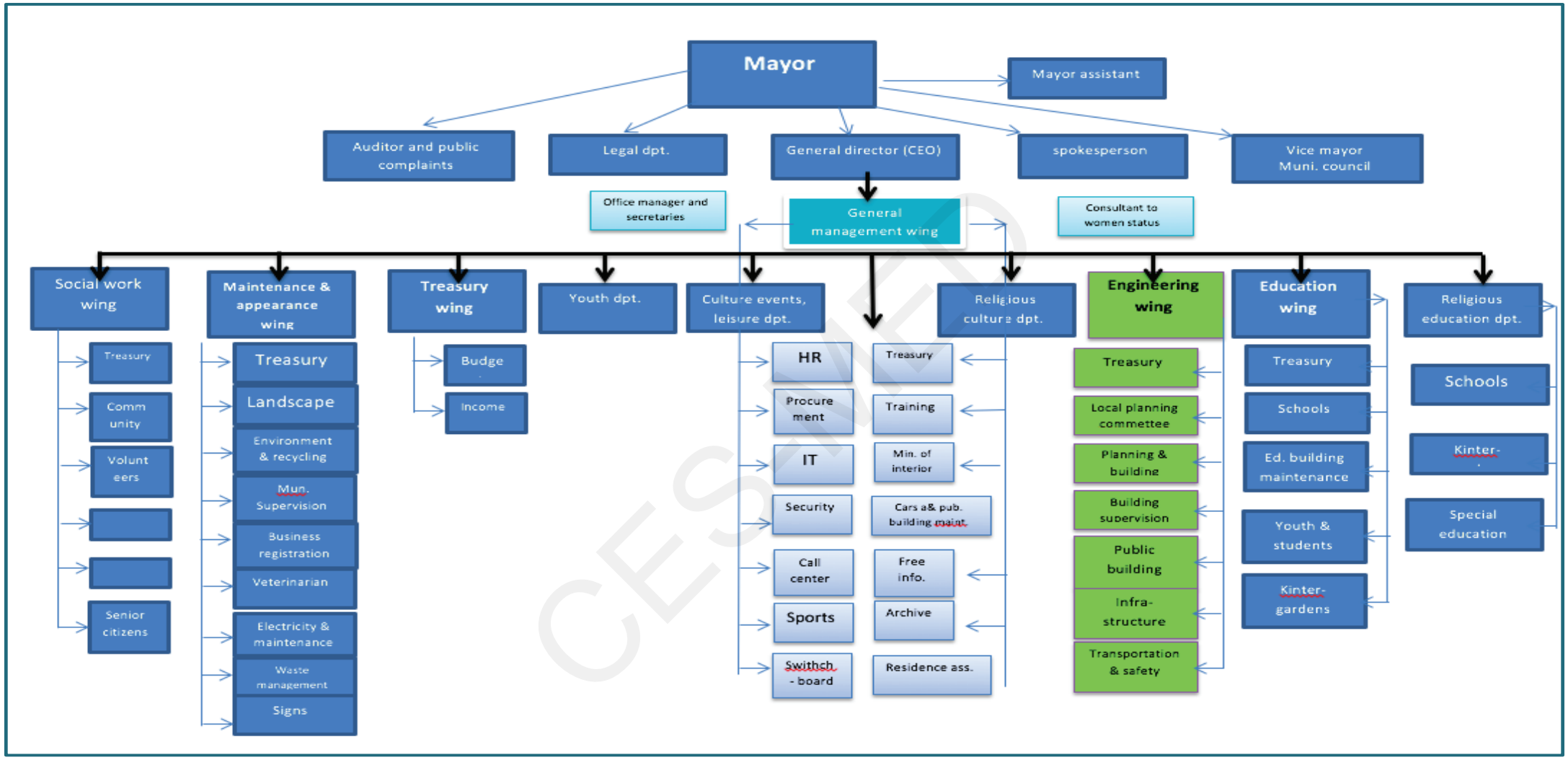

Figure 9 –Municipality of Rosh HaAyin Organogram

1.4.3 Involvement of stakeholders and citizens

The involvement of all citizens and stakeholders is considered crucial for achieving the set targets. The citizens are the most important resource for the city, especially in the GHG saving targets.

In addition, in all schools several programs for GHG emission reduction shall be incorporated. The Ministry of National Infrastructures, Energy and Water Resources and the Ministry of Education have developed a program suitable for children from grades 1-9. This way all children will be taught on the importance of energy saving.

1.4.4 Budget – SEAP financing sources

Local Authorities' (LAs) budgets come from two main sources. The first source and largest portion of the budget comes straight from the national government and depends directly on the amount of residents. The second source is local taxes, which depend heavily on the socioeconomic level of the residents, number of businesses, and factories in the LA.

The municipal annual budget is 378 Mil. NIS (84.5 Mil Euro). Out of this, about 33% is governmental budget.

For the implementation of the SEAP the total budget is around 554.92 million NIS, out of which 450.54 million NIS are expected to be mobilized from private actors during the SEAP's implementation. The Municipality of Rosh HaAyin will contribute to the remaining total budget with around 10%, while the rest of the financial needs of the SEAP will be fulfilled from EU Funding Schemes, the Israeli Government and the Ministries of Finance and Environment and private funds that will be motivated through the SEAP proposed actions.

Any action to be implemented will have a clear budget and implementation plan and will be executed pending the approval of the annual budget, as required by the municipal regulations.

Chapter 2 : Baseline Emissions Inventory

2.1 Baseline Emission Inventory Methodology

2.1.1 Baseline Year

According to the Covenant of Mayors Guidelines, the recommended baseline year for the data that lead to the Emissions Reporting is 1990. The nearest to this year complete and reliable data that the Municipality of Rosh HaAyin holds are data from 2011. Consequently, 2011 is selected as the baseline year.

2.1.2 Emission Factors and Conversion Rates

For the Baseline Emissions Inventory, the IPCC emission factors have been used for all fuel types in accordance to the CoM Guidebook, except from electricity, where the Israeli Electricity Company (IEC) publication "Commitment to reduce Environmental Effects" was used.

The conversion rates used, wherever applicable, were according to the JRC Guidebook for Southern municipalities, or the CoM Guidebook for European Municipalities when there were no such data in the first one. Conversion rates for LPG were from the 2006 IPCC Guidelines.

The emission factors used in the calculations of the Baseline Emissions Inventory for the Municipality of Rosh HaAyin, and all the conversion rates used in the BEI are explained in the table below.

Table 4 - Emission Factors (tn CO_2 / MWh) and Conversion Rates Used in the BEI

Energy Source	Emission Factor (tn CO_2 / MWh)	Conversion Rates Used
Electricity	0.733	-
LPG	0.227	2.21 kg/m^3 13.14 MWh/tn
Diesel	0.267	10 kWh/lt
Gasoline	0.249	9.2 kWh/lt
Solar Thermal	0	-

As far as the emissions from the Solid Waste Management sector are concerned, the IPCC default method is used to calculate the Methane (CH_4) emissions that are produced from the landfilling process and then it was considered that each ton of CH_4 produced equals to 25 tons of CO_2 equivalent.

2.1.3 Sectors to be included in the BEI

All the compulsory sectors of the SEAP guidelines are included in the SEAP calculations for the total energy consumption and emissions:

- Municipal Buildings / Equipment / Facilities;
- Tertiary (non Municipal) Buildings / Equipment / Facilities;
- Residential Buildings;
- Public Lighting;
- Transport (Municipal / Public / Private).

Out of the optional sectors to be included in the BEI, the consultant consortium in close collaboration with the municipality have selected **industries and agriculture**, which are responsible for a noteworthy contribution in the electricity consumptions, as well as **solid waste treatment**.

Especially, concerning the industrial sector, it should be noted that in their majority high-tech companies producing software industrial products exist in the area.

2.2 Energy Consumption

The total energy consumption in the Municipality of Rosh HaAyin is summarized in Table 5 below. The results in the table are further analysed in the sub-sections of this section.

Table 5 - Total energy consumption in Rosh HaAyin

Sector of energy consumption	Electricity	LPG	Diesel	Gasoline	Solar Thermal
	MWh				
Agriculture	769.45	-	-	-	-
Municipal Buildings/Equipment/Facilities	4,550.54	-	-	-	-
Public Lighting	4,409.71	-	-	-	-
Residential Buildings	96,685.80	11,311.43	-	-	20,588.40
Commercial Buildings/Equipment/Facilities	136,408.89	-	-	-	-
Industry	21,109.28	-	-	-	-
Municipal Transport	-	-	95.07	814.91	-
Public Transport	-	-	13,845.50	-	-
Private transport	-	-	35,159.30	70,895.89	-
TOTAL	**263,933.67**	**11,311.43**	**49,099.87**	**71,710.80**	**20,588.40**

The total amount of energy that is consumed in the Municipality of Rosh HaAyin is **416,644.17 MWh.**

The total energy consumption per sector is shown in the spider chart below.

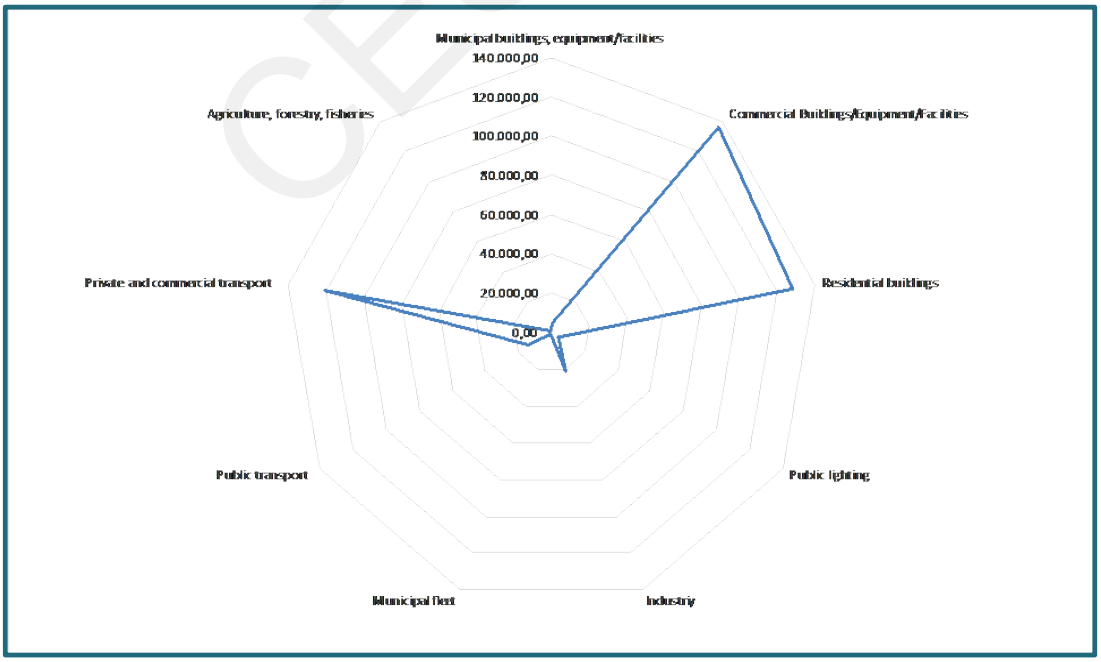

Figure 10 - Energy Consumption per sector

2.2.1 Agricultural Sector

The Municipality of Rosh HaAyin, according to the IEC data, has an annual consumption of 769.452 kWh of electricity for 2011.

Table 6 – Agricultural Sector Energy Consumption

Consumer	Electricity (MWh)	Emission Factor	CO_2 Emissions (tn)
Agriculture	769.45	0.733 tn/MWh	564.00

2.2.2 Municipal Buildings, Equipment / Facilities

This category includes all buildings managed by the Municipality of Rosh HaAyin. The buildings include:

- structural and municipal offices,
- educational buildings,
- security public buildings,
- health and welfare buildings,
- clubs,
- shelters,
- sports halls,
- religious buildings and sites,
- culture structures, and
- community structures.

No municipal facilities exist in the municipality, in terms of sports or water pumping, the later one being undertaken by a private company and reported in the tertiary sector facilities.

As far as the Municipal Offices and Structures are concerned, electricity is used for both operational and heating / cooling needs, while there is no usage of diesel or other types of fuel for the buildings' energy needs.

In Table 7, below, the electricity consumptions of each municipal building are being recorded, according to the IEC data the Municipality has available.

Table 7 - Municipal Buildings/Equipment/Facilities Electricity Consumption

Site Type	Annual Electricity Consumption (MWh)	Emission Factor	CO_2 Emissions
Structural and municipal offices (3 Sites)	555.2	0.733 tn/MWh	407.00
Educational Buildings (50 Sites)	2,873.3		2,106.10
Security public buildings (3 sites)	27.2		19.93
Health and welfare (7 sites)	134.0		98.25
Clubs (11 sites)	201.4		147.63
Shelters (34 sites)	118.5		86.85
Sports halls (3 sites)	318.0		233.13
Religious buildings and sites (6 sites)	33.1		24.25
Cultural sites (4 sites)	144.4		105.84
Community structures (2 sites)	145.4		106.56
TOTAL	**4,550.5**		**3,335.55**

Figure 11 shows the allocation of the total consumption per sector of the Municipal Buildings/Equipment/Facilities, with the educational buildings being the most consuming category.

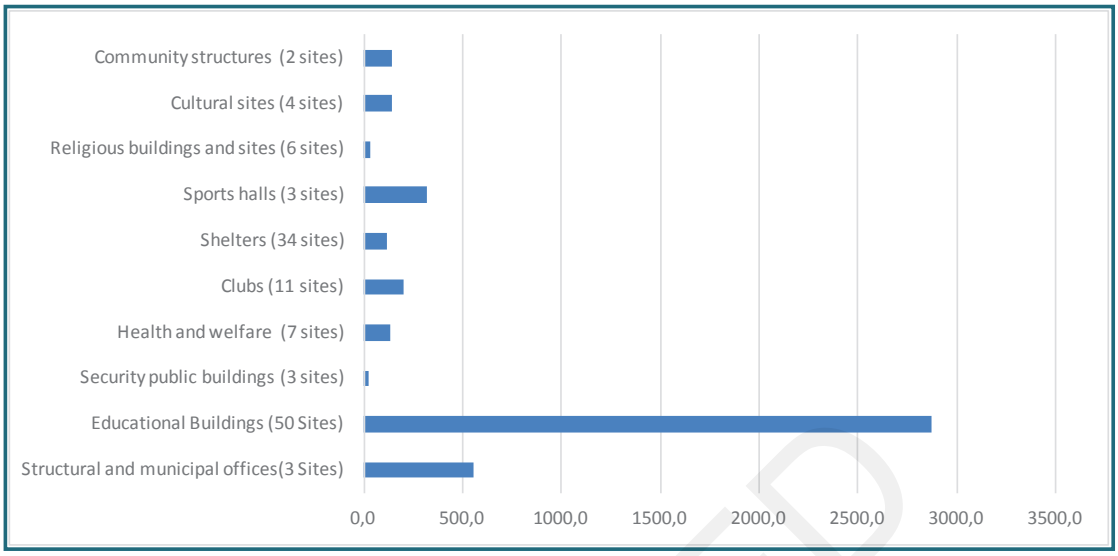

Figure 11 - Annual Electricity Consumption of Municipal Buildings / Equipment / Facilities (MWh)

Especially on the educational buildings, there are four different levels of education, namely preschools, elementary schools, middle schools and high schools. The figure below presents the distribution of electricity consumptions among the different categories. Rosh HaAyin Municipality has two (2) High Schools, two (2) Middle Schools, thirteen (13) Elementary Schools and thirty-three (33) Preschools. The following pie chart (Figure 12) shows the percentage of consumption for each educational sector.

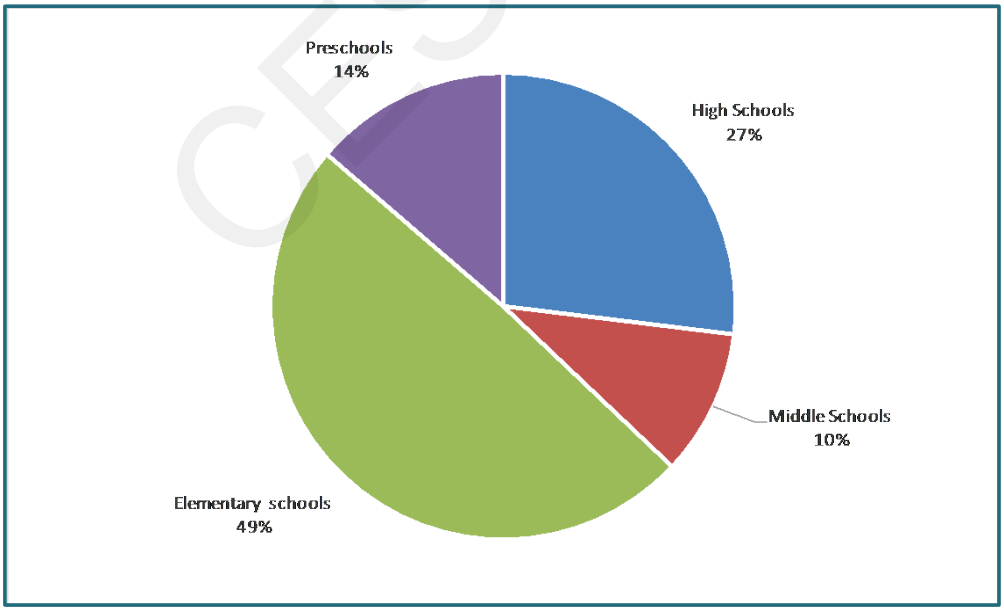

Figure 12 - Contribution of each educational level in Educational Buildings' consumption

The total consumption per education level is shown in Table 8. Full data for each school building that belongs to the Municipality of Rosh HaAyin is reported in ANNEX A.

Table 8 - Available data for electricity consumptions per Education Level

Education Level	Annual Energy Consumption (kWh)
High Schools	773,657
Middle Schools	291,184
Elementary schools	1,414,517
Preschools	393,908
TOTAL	**2,873,266**

2.2.3 Municipal Public Lighting

As far as the public lighting sector is concerned, there are two types in the Municipality of Rosh HaAyin. The main consumption comes from the street lighting, while the rest of it belongs to the traffic lights. There are no parking lot lights or other kinds of public lighting. The available data for the electricity consumed in 2011 for public lighting, according to the IEC, is shown in Table 9.

Table 9 - Electricity Consumptions for Municipal Public Lighting

Lighting Type	Annual Electricity Consumption (MWh)	Emission Factor	CO2 Emissions (tn)
Street Lighting	4,390.88	0.733 tn/MWh	3,218.52
Traffic lights	18.82		13.80
TOTAL	**4,409.70**		**3,232.32**

The majority of the electric consumption refers to the street lighting (99.6%), whereas traffic lights have a very small impact in the overall consumption, as shown in the pie chart.

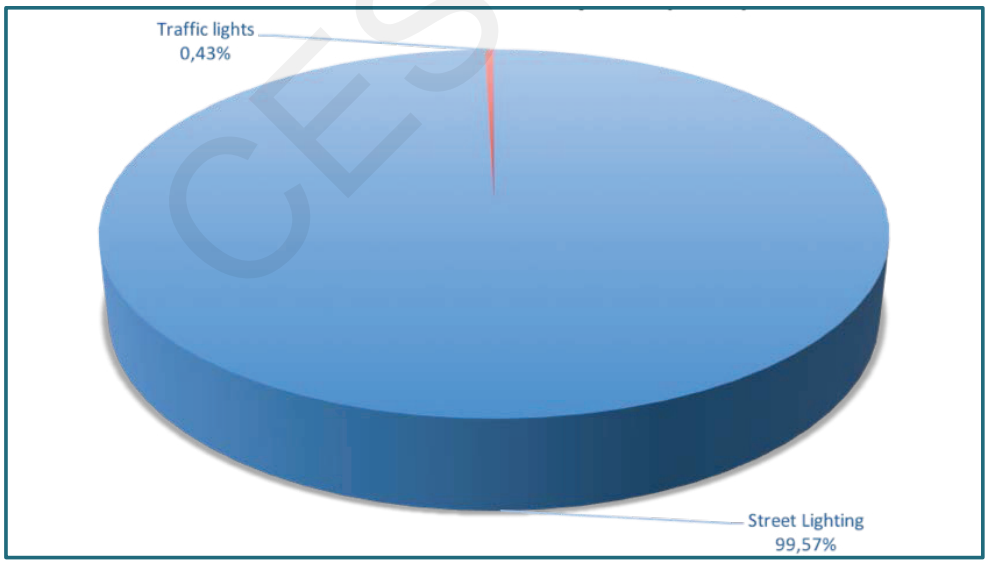

Figure 13 - Contribution of each Street Lighting sector in total consumption

2.2.4 Residential Buildings

Electricity

The residential sector is predominated with the use of electricity. The vast majority of house owners use electricity for all heating / cooling purposes, with a minor percentage attributed to cooking gas.

According to the IEC, the total consumption of the residential sector in 2011 is shown in Table 10 below.

Table 10 - Electricity Consumption in Residential Sector

Consumer	Electricity (MWh)	Emission Factor	CO_2 Emissions (tn)
Residential sector	96,685.8	0.733 tn/MWh	70,871.69

Liquefied Petroleum Gas

Except from electricity, there is a small usage of cooking gas from the households of the Municipality of Rosh HaAyin. For the identification of the Liquefied Petroleum Gas (LPG) consumption used for cooking, data at the national level was gathered from the gas company, Pazgaz.

According to Pazgaz, the average consumption for each household is 3 m^3 monthly, or 36 m^3 annually. With the number of households being 10,820 according to municipal records, the calculations of the following table are made. The conversion from m^3 to kWh was realized using LPG density in gas form (2.21 kg/m^3) and Net Calorific Value of 13.14 MWh/tn, according to IPCC 2006 guidelines.

Table 11 - LPG Consumption in Residential Sector

Consumer	LPG (MWh)	Emission Factor	CO_2 Emissions (tn)
Residential sector	11,311.43	0.227 tn/MWh	2,567.69

Solar Thermal

According to the local authorities, there are water-heating facilities that use solar power in order to heat water. The calculations are based on info available through web sources (Sustainable Business website and journal reports), according to which for each person in Israel, there are 0.56 m^2 of Solar Water Heaters. MIEW mentions also that the efficiency of SHWH is around 40-60%, so an average of 50% is used for the calculations. The average amount of solar energy in Rosh HaAyin is 1,845 kWh/m^2 and the average solar panel is 2.5 m^2.

The calculations are according to the following mathematical formula:

Annual output per person =average efficiency*SHWH per person*average solar energy

= 0.50*0.56*1,845 = 516 kWh

And for the Rosh HaAyin population of 39,900 the result is:

Annual City output = population*annual output per person

= 39,900 * 0.516 = 20,588.4 MWh.

The corresponding **emissions saved from the SHWH are 15,091.3 tn CO_2**.

Summary

The residential sector, in total, consumes energy from three energy sources. The summarized data for the residential sector are in the following table.

Table 12 - Total energy consumption in Residential Sector

Source	MWh
Electricity	96,685.80
LPG	11,311.43
Solar Thermal	20,588.40
TOTAL	**128,585.63**

The following figure shows the allocation of energy consumption per energy source in the Residential Sector.

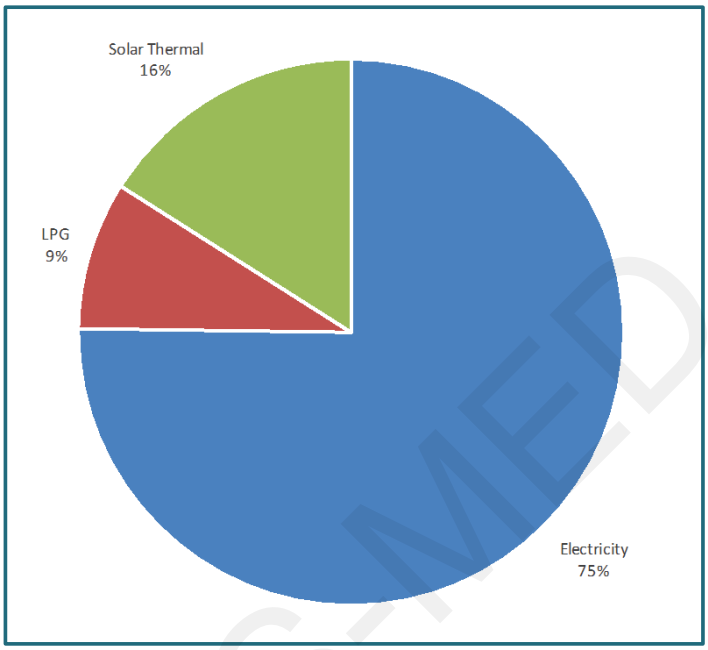

Figure 14- Energy Sources in the Residential Sector

2.2.5 Commercial Buildings, Equipment / Facilities

Data from the IEC for 2011 were gathered and presented in Table 13 below. The available data refer to the Municipality of Rosh HaAyin and, apart from the commercial buildings, there are also included electricity consumptions from the water pumping facilities, which are managed by a private company.

Table 13 - Consumptions for Commercial Buildings / Equipment / Facilities

Consumption Category	Electricity (MWh)	Emission Factor	CO_2 Emissions (tn)
Commercial Buildings	133,426.05	0.733 tn/MWh	97,801.29
Water Pumping Facilities	2,982.84		2,186.42
TOTAL	**136,408.89**		**99,987.72**

The allocation of the consumption, as shown in the pie chart below, is dominated by the commercial buildings consumption, whereas the water pumping facilities consume only 2% of the total electricity.

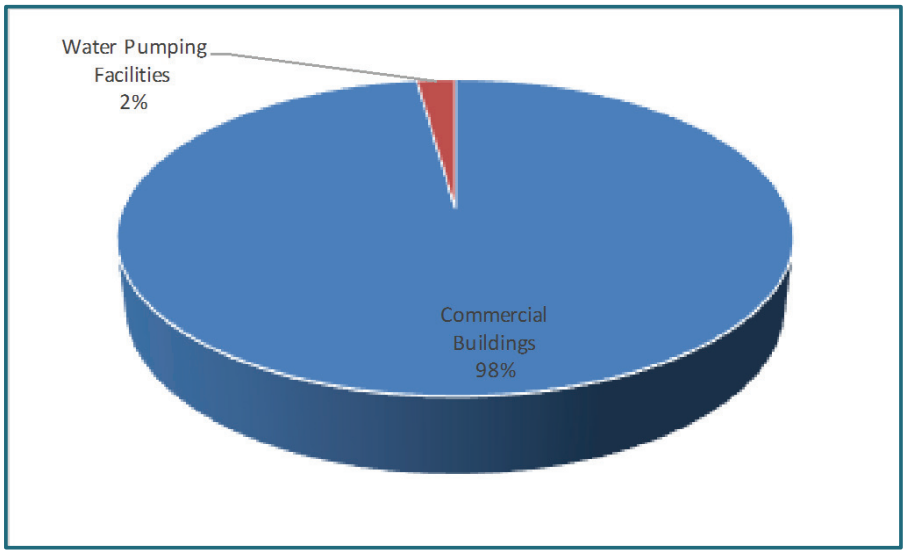

Figure 15 - Commercial Buildings/Equipment/Facilities Consumptions

2.2.6 Industrial Sector

The industrial sector data come from the IEC and refer to the annual consumption of electricity in the local industries. As mentioned before, there is no heavy industry in the area, only small tech companies classified as industries.

The total electricity consumption for 2011 is shown in Table 14 below.

Table 14 - Industrial sector consumption

Consumer	Electricity (MWh)	Emission Factor	CO_2 Emissions (tn)
Industrial	21,109.28	0.733 tn/MWh	15,473.10

2.2.7 Transport

2.2.7.1 Municipal Fleet

As far as the Municipal Transport is concerned, all the available information gathered is from the Municipality of Rosh HaAyin, according to the accountant's office. It was not possible to obtain data per vehicle, so a simple division between type of vehicles (passenger vehicles using Gasoline, and small pick up trucks, consuming Diesel) was made.

For all the vehicles, the total fuel consumptions for diesel and gasoline are presented in Table 15 below.

Table 15 - Municipal Fleet Consumptions per fuel type

Vehicle Categories	Diesel			Gasoline 95		
	lt	MWh	CO_2 Emissions (tn)	lt	MWh	CO_2 Emissions (tn)
Passenger Vehicles	0	0	0	88,577	814.91	202.91
Pickup trucks < 4tn	9,507	95.07	25.38	0	0	0
TOTAL	**9,507**	**95.07**	**25.38**	**88,577**	**814.91**	**202.91**

The following pie chart shows that Gasoline is the most used fuel type, as far as the Municipal fleet is concerned, whereas Diesel is used on only 10% of the total energy needed.

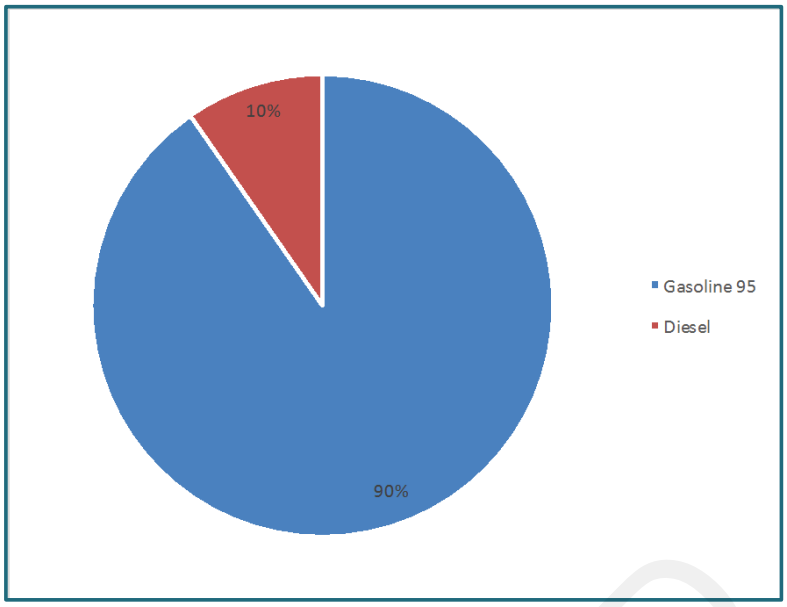

Figure 16 - Municipal Fleet Fuel Consumption

2.2.7.2 Public Transport

The data on public transport were not directly available from the company serving the area. The approach utilized includes the calculation of the total distance travelled for all the public bus lines within the local authority's borders, based on the number of routes and the route frequency at an annual basis.

There are 11 bus lines covering the area of Rosh HaAyin, with most of them working for 6 days a week. There is no bus line operating all week, according to the municipal data, because of the Shabbat, the Israeli rest day. The available data from the Municipality of Rosh HaAyin that was used to calculate the final energy consumption of this sector is available in ANNEX B.

The average consumption of the public buses at national level for the year 2011 was identified from the CBS to be 51.162 litres of diesel per 100 km. Table 16 below summarizes the results on public transportation consumptions.

Table 16 - Public Transport Fuel Consumption

Distance Travelled within LA (km)	Diesel Consumption		Emission Factor	CO_2 Emissions (tn)
2,706,162	1,384,549.67 lt	13.845.50 MWh	0.267 tn/MWh	3,696.75

2.2.7.3 Private and Commercial Transport

Regarding private transportation, the number of vehicles registered at the area of Rosh HaAyin is available from the Municipal Records. Based on the CBS publication concerning the average distance each vehicle type covers, estimations for the distance within the local area of Rosh HaAyin and average consumptions per vehicle type, the total energy consumption is calculated. The data concerning the consumptions are presented in Table 17.

Table 17 - Total Energy Consumption for Private and Commercial Transport

Vehicle Type	Number of Vehicles	Distance Travelled within LA (km/yr)	Energy Consumption (MWh)	Emission Factor (tn/MWh)	CO_2 Emissions (tn)
Private	12,620	5,643	49,138.12	0.249	12,235.4
Truck (up to 4 tons)	1,337	5,082	20,003.40	0.249	4,980.8
Truck (more than 4 tons)	599	10,197	27,486.01	0.267	7,338.8
Minibus	83	16,632	1,143.02	0.249	284.6
Motorcycle	828	2,508	611.36	0.249	152.2
Taxi	99	40,800	3,716.06	0.267	992.2
Buses	26	29,750	3,957.23	0.267	1,056.6
TOTAL			**106,055.20**		**27,040.6**

The data in Table 17 above are based in data available by the CBS. All the assumptions and the results used for the calculations of the total energy consumption of the Private and Commercial Transport Sector are in Table 18 below.

The average consumption was identified based on the municipal personnel's input and the consultants' knowledge on the country. The percentages of distance travelled within the local authority's borders are based on a study by Technion University.

Table 18 - Assumptions used for Private and Commercial Transport calculations

Car Type	Average Distance Travelled (km/yr)	Percentage of Distance Travelled within LA	Average consumption (lt/100km)	Fuel Type
Private	17,100	33%	7.5	Gasoline 95
Truck (up to 4 tons)	15,400	33%	32	Gasoline 95
Truck (more than 4 tons)	30,900	33%	45	Diesel
Minibus	50,400	33%	9	Gasoline 95
Motorcycle	7,600	33%	3.2	Gasoline 95
Taxi	81,600	50%	9.2	Diesel
Buses	59,500	50%	51.16	Diesel

2.2.8 Final Energy Consumption

In Table 19 all the energy consumptions within Municipality of Rosh HaAyin are presented, **totalling 416.64GWh**.

Table 19 - Total Energy Consumption

Category		FINAL ENERGY CONSUMPTION [MWh]															
		Electricity	Heat/cold	Fossil fuels								Renewable energies					Total
				Natural gas	Liquid gas	Heating Oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Plant oil	Biofuel	Other biomass	Solar thermal	Geothermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:																	
Municipal buildings, equipment/facilities		4.550,54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.550,54
Tertiary (non municipal) buildings, equipment/facilities		136.408,89	-	-	-	-	-	-	-	-	-	-	-	-	-	-	136.408,89
Residential buildings		96.685,80	-	-	11.311,43	-	-	-	-	-	-	-	-	-	20.588,40	-	128.585,63
Public lighting		4.409,71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.409,71
Industry	Non-ETS	21.109,28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.109,28
	ETS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,00
	Total	21.109,28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.109,28
Subtotal		263.164,22	0,00	0,00	11.311,43	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	20.588,40	0,00	295.064,05
TRANSPORT:																	
Municipal fleet		-	-	-	-	-	95,07	814,91	-	-	-	-	-	-	-	-	909,98
Public transport		-	-	-	-	-	13.845,50	-	-	-	-	-	-	-	-	-	13.845,50
Private and commercial transport		-	-	-	-	-	35.159,30	70.895,89	-	-	-	-	-	-	-	-	106.055,19
Subtotal		0,00	0,00	0,00	0,00	0,00	49.099,87	71.710,80	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	120.810,67
OTHER:																	
Agriculture, forestry, fisheries		769,45															769,45
TOTAL		263.933,67	0,00	0,00	11.311,43	0,00	49.099,87	71.710,80	0,00	0,00	0,00	0,00	0,00	0,00	20.588,40	0,00	416.644,16

2.3 Local Electricity Production

There are no PV or other type of energy production installations in the area of Rosh HaAyin.

Table 20 - Local Electricity Production

Locally generated electricity (ETS and large-scale plants > 20 MWe not recommended)	Renewable electricity produced [MWh]	CO2 emission factor [t/MWh produced]	CO2 / CO2-eq emissions [t]
Wind			
Hydroelectric			
Photovoltaic			
Geothermal			
TOTAL			

2.4 Local Heating / Cooling Production

There are no heating / cooling production installations in the area of Rosh HaAyin.

Table 21 - Local Heat/Cold Production

Local heat/cold production plants	Heat/cold produced [MWh]		Energy carrier input [MWh]											CO2 / CO2-eq emissions	
	Total	from renewable sources	Fossil fuels					Waste	Plant oil	Other biomass	Other renewable	other		Fossil sources	Renewable Sources
			Natural gas	Liquid gas	Heating oil	Lignite	Coal								
Combined Heat and Power															
District Heating (heat only)															
Other															
TOTAL															

2.5 Solid Waste Management

Solid waste management is one of the optional sectors to be included in Rosh HaAyin Municipality's BEI. According to the data collected for 2011 there are two types of waste management, landfill and recycling. There is also an amount of yard waste for recycling that is not included in the overall recycling rate. The data available from the Municipality of Rosh HaAyin is displayed in Table 22.

Table 22 - Waste and Recycling quantities per type of waste

Type	Amount of Waste Collected (ton/yr)
Waste to landfill	
Garbage (not including yard trimmings)	13,000
Yard Waste	0
Waste to recycling	
White Paper and Newspaper	359
Cardboard	1,007
Glass	121
Metal	17
Plastic	54
Organic Waste	150
Total recycling	**1,708**
Yard Waste for recycling not included in the overall recycling rate	4,500
Total Collected Waste (Garbage + Recycling + Yard Waste)	**19,208**

For the calculation of the emissions regarding the Municipality's solid waste, the IPCC default method has been used. The method is based on the main equation that follows.

$$\text{Methane emissions (Gg/yr)} = (MSW_T \bullet MSW_F \bullet MCF \bullet DOC \bullet DOC_F \bullet F \bullet 16/12\text{-}R) \bullet (1\text{-}OX) \quad (1)$$

Where:

- MSWT total MSW generated (Gg/yr)
- MSWF fraction of MSW disposed to solid waste disposal sites
- MCF methane correction factor (fraction)
- DOC degradable organic carbon (fraction) (kg C/ kg SW)
- DOCF fraction DOC dissimilated
- F fraction of CH4 in landfill gas (IPCC default is 0.5)
- 16/12 conversion of C to CH4
- R recovered CH4 (Gg/yr)
- OX oxidation factor (fraction – IPCC default is 0)

The IPCC default method assumes that all the potential of CH_4 emissions is released during the same year the waste is disposed of. The method introduces various specific default values and recommendations, for use in countries with lack of statistical data for Solid Waste.

The calculation of the degradable correction factor (DOC) is based on the following equation.

$$DOC=0.4*A+0.17*B+0.15*C+0.3*D \quad (2)$$

Where:

- A Percentage of paper and textiles in SW
- B Percentage of garden and park waste and other organic putrescible in SW
- C Percentage of Food waste in SW
- D Percentage of wood and straw waste in SW

The approach for the calculation of the above factors was to initially divide the total collected waste in organic waste, paper and plastic, according to the national percentages for waste composition by weight (40% organic, 17% paper, 13% plastic). Out of these amounts, the recycled quantities were deducted, in order to come up with the quantities being landfilled and the revised factors.

According to the local authorities, there are installations in the waste landfill facilities that capture part of the CH_4 that is produced. According to Ayalon et al., the efficiency of CH_4 being captured varies from 40 to 90%. As far as Israel is concerned, the average efficiency that the paper proposes is 50%, so in the calculations this efficiency for the CH_4 capturing process is being used.

For the city of Rosh HaAyin, the following table with values for each one of the above variables occurs.

Table 23 - Waste Emissions Calculation factors

Variable	Value / Equation
MSWt	19 Gigagrams
MSWf	0.6768
MCF	1
DOC	0.1485
DOCf	0.56 (T average in Israel)
F	0.5
16/12	
R	0.36036 Gigagrams of CH_4
OX	0

The result of equation 1 according to the Table 23 values, equals to **0.36036 Gigagrams of CH_4.**

Conversion factor from methane to carbon dioxide used was according to 2006 IPCC Guidelines, namely 25, which equals to **9,009 tn CO_2**.

2.6 CO_2 Emissions

The emissions of CO_2 for the sectors that have been described in the previous sections are available, in total, in the following table.

Table 24 - Total Emissions for the Municipality of Rosh HaAyin

Sector		CO2 emissions [t]/ CO2 equivalent emissions [t]															
		Electricity	Heat/cold	Fossil fuels								Renewable energies					Total
				Natural gas	Liquid gas	Heating Oil	Diesel	Gasoline	Lignite	Coal	Other fossil fuels	Biofuel	Plant oil	Other biomass	Solar thermal	Geothermal	
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:																	
Municipal buildings, equipment/facilities		3.335,55															3.335,55
Tertiary (non municipal) buildings, equipement/facilities		99.987,72															99.987,72
Residential buildings		70.870,69			2.567,69										0,00		73.438,38
Municipal public lighting		3.232,32															3.232,32
Industries	Non-ETS	15.473,10															15.473,10
	ETS (not recommended)																0,00
	Total	15.473,10	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	15.473,10
Subtotal		192.899,37	0,00	0,00	2.567,69	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	195.467,06
TRANSPORT:																	
Municipal fleet							25,38	202,91									228,30
Public transport							3.696,75										3.696,75
Private and commercial transport							9.387,50	17.653,10									27.040,60
Subtotal		0,00	0,00	0,00	0,00	0,00	13.109,63	17.856,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	30.965,64
OTHER:																	
Agriculture, forestry, fisheries		564,01															564,01
OTHER NON ENERGY RELATED:																	
Waste management																	9.009,00
Waste water management																	
TOTAL		193.463,38	0,00	0,00	2.567,69	0,00	13.109,63	17.856,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	236.005,71

The solar thermal emissions from the Residential Sector are equal to 0, because their emission factor is 0 tn/MWh produced.

The total emissions in Rosh HaAyin equal to **236,005.71 tn CO_2.**

Chapter 3 : SEAP Actions

3.1 Target for 2020

3.1.1 Introduction

The municipality's representatives, through the BEI identification, acknowledged the most significant sectors affecting their carbon footprint, namely the tertiary, closely followed by the residential, and the transport sectors. These sectors thus constitute the fields where the municipality's priority actions are focused, while at the same time actions are suggested in the other directions as well.

However, the municipality faces a unique challenge until 2020. The new neighbourhoods planned are expected to double the city's residents by that year, impacting on the whole city's consumptions and especially those related to the residential, tertiary and transport sectors.

In this respect, the use of the national coefficient for Israel (k=1.27) for the selected baseline year (2011) under the Business as Usual (BAU) scenario suggested by the JRC guidelines for South municipalities is not considered appropriate to cover this magnitude of population increase in such a short period of time. Instead, two alternative scenarios are studied:

- Development of a no-actions scenario, as a modified BAU scenario, in an effort to estimate the municipality's consumptions in 2020, in case that no measure to curtail the energy consumption growth is taken.
- Setting per capita reduction targets.

The methodology and the adopted assumptions for the development of both scenarios are being presented along with the results in the following paragraphs.

3.1.2 No Actions Scenario

For the development of this scenario, data from the available municipal studies and experts' opinions were utilised. Based on the existing urban plans and topographic maps regarding the magnitude and surface (in terms of square meters) per sector of the new neighbourhood to be built against the existing one, a meeting among the Consultants supporting the municipality in the development of its SEAP and municipal employees from selected departments (environment, engineering, infrastructure, director general) was realised. Upon consideration of these plans, and taking into account that even in the "no actions scenario", the consumptions will be significantly increased, but not proportionally, due to the use of more efficient technologies, the following decisions were made regarding the assumptions to be applied:

- The consumption of buildings for municipal services is considered the same, apart from schools which have been doubled to cover the population needs and a number of additional sports facilities. Overall, an increase of 65% of the municipal consumptions has been calculated.
- The residential sector consumptions will be doubled by 2020.
- The tertiary sector is already fully developed in Rosh HaAyin. There are new shops and entertainment facilities planned in the new neighbourhood, which will be in any case more energy efficient; thus the increase for this sector is estimated at 50%.
- The area of the new neighbourhood covers much less surface than the old one (use of skyscrapers and high multi-family buildings), while LED technologies will be utilised. As a result, the lighting needs are considered to be increased by 50%.

- The transport sector, apart from the municipal fleet which will not be affected, is considered to be increased by 75%.
- Finally, emissions from waste will be doubled, since the quantities will be doubled as well.

For the South municipalities setting their emission reduction targets according to the BAU scenario, the hypothesis of continuing current trends in population, economy, technology and human behaviour, without the implementation of a SEAP or any other national or local policy measures has been made. The key difference for the national coefficient to be used under the BAU scenario according to these parameters is the trend in the population. Thus, effort will be made to identify the part of the national coefficient that is attributed to the rest of the factors.

Data regarding the evolution of the population in Rosh HaAyin in an annual basis for the period 2003-2013 were retrieved by the CBS. According to this data, the average annual growth rate of the population within the last decade is 1.65% and the cumulative one 16.5%, and thus the forecasted population of Rosh HaAyin for 2020 is 46,500 citizens. In the baseline year of 2011, the population in the municipality was 39,900, and this number is expected to reach 80,000 by 2020.

As mentioned before, the growth rate envisaged by the JRC guidelines for South Municipalities is 1.27 for Israel (reference year: 2011) and this number is expected to cover both the regions' economic and population growth. Although the modelling procedure and data of JRC cannot be replicated, it is assumed that out of this 27% increase compared to the baseline scenario, 17% is attributed to the population growth - cumulative difference between 2011 and projected 2020 population as calculated in the above paragraph- under BAU conditions (not duplication of city), and therefore the rest 10% can be attributed to the economic growth.

Based on the above assumptions, Table 25 on the following page presents the energy consumptions for the Baseline and No Actions Scenario, taking also into consideration the 10% economic growth rate.

Table 25 - Energy consumptions (MWh) for the Baseline and the No-Actions Scenarios

Sector	Baseline Scenario	Population impact	Economic growth impact	No-Actions Scenario
Municipal Buildings/ Equipment/ Facilities	4,550.54	65%	10%	8,259.23
Tertiary Buildings/Equipment/ Facilities	136,408.89	50%	10%	225,074.67
Residential Buildings	128,585.63	100%	10%	282,888.39
Public Lighting	4,409.71	50%	10%	7,276.02
Industry (Non-ETS)	21,109.28	0%	10%	23,220.20
Municipal Fleet	909,98	0%	10%	1,000.98
Public Transport	13,845.50	75%	10%	26,652.58
Private & commercial Transport	106,055.19	75%	10%	204,156.24
Agriculture	769.45	0%	10%	846.40
TOTAL	**416,644.16**			**779,374.71**

The corresponding emissions for the No-Actions Scenario are provided in Table 26 below. A basic assumption for the calculation of these emissions is that the national emission factor for electricity is 0.60 tn CO_2 /MWh in 2020 due to the increased penetration of natural gas in the electricity generation mix. This figure was provided by the Coordinator of the Tag HaSviva Programme, under the Ministry of Environment and Union of Municipalities, based on projections of the IEC.

Table 26 - CO_2 emissions for the No-Actions Scenario (tn CO_2)

Sector	Electricity	Liquid Gas	Diesel	Gasoline	Solar	Total
Municipal Buildings/ Equipment/ Facilities	4,955.54					4,955.54
Tertiary Buildings/Equipment/ Facilities	135,044.80					135,044.80
Residential Buildings	127,625.26	5,648.93			0.00	133,274.19
Public Lighting	4,365.61					4,365.61
Industry (Non-ETS)	13,932.12					13,932.12
Municipal Fleet			27.92	223.20		251.13
Public Transport			7,116.24	0.00		7,116.24
Private & commercial Transport			18,071.00	33,982.17		52,053.17
Agriculture	507.84					507.84
Waste						18,018.00
TOTAL	**286,431.17**	**5,648.93**	**25,215.16**	**34,205.38**	**0**	**369,518.54**

Therefore, the municipality's obligation under the Covenant of Mayors is to reduce its CO_2 emissions by at least 20% of its emissions in the No-Actions Scenario, namely 73,904 tn CO_2.

3.1.3 Per Capita Reduction Targets Scenario

The possibility to work also on the per capita reduction basis was studied by the authors' team. It should be noted however that according to Cerutti et al. (2013), this option is not allowed for South Municipalities, when working under the BAU scenario.

The total CO_2 emissions in the Baseline scenario are 236,005.71 tn CO_2, with a corresponding population in the municipality of 39,900 citizens, for 2011 as a reference year. The per capita emissions are thus calculated to be 5.9 tn CO_2 /citizen.

Calculating a CO_2 increase strictly due to the economic growth rate of 10%, as in the case of the no actions scenario described above, and not taking into consideration the population increase, this results in a 6.49 tn CO_2 / citizen in 2020. With a 20% reduction target set, the per capita reductions should be 1.3 tn CO_2, or 5.19 tn CO_2 emissions in 2020.

The overall amount of the foreseen emission reductions by the municipality till 2020, as described in detail in the actions below, reaches 73,963.66 tn CO_2. Considering a population of 80,000 citizens, this corresponds to a reduction of 0.92 tn CO_2 / citizen against the baseline year, or emissions of 4.98 tn CO_2 per capita, which means that with the existing actions, the target of 20% reduction is more than achieved.

In case per capita reduction targets are set without considering the economic growth increase, the emissions per capita would be 4.72 tn CO_2. This figure presents only a 5.5% deviation from the per capita reduction target set according to the no actions scenario.

Based on the above, it is considered that the reduction targets set by the municipality under the no actions scenario are realistic, especially if the rapid population increase expected in the region is taken into account.

3.1.4 Overview

The actual emission reduction target undertaken by the municipality of Rosh HaAyin is 20.00%, thus 73,963.66 tn CO_2. Each sector's contribution in the overall reduction target is presented in Figure 17.

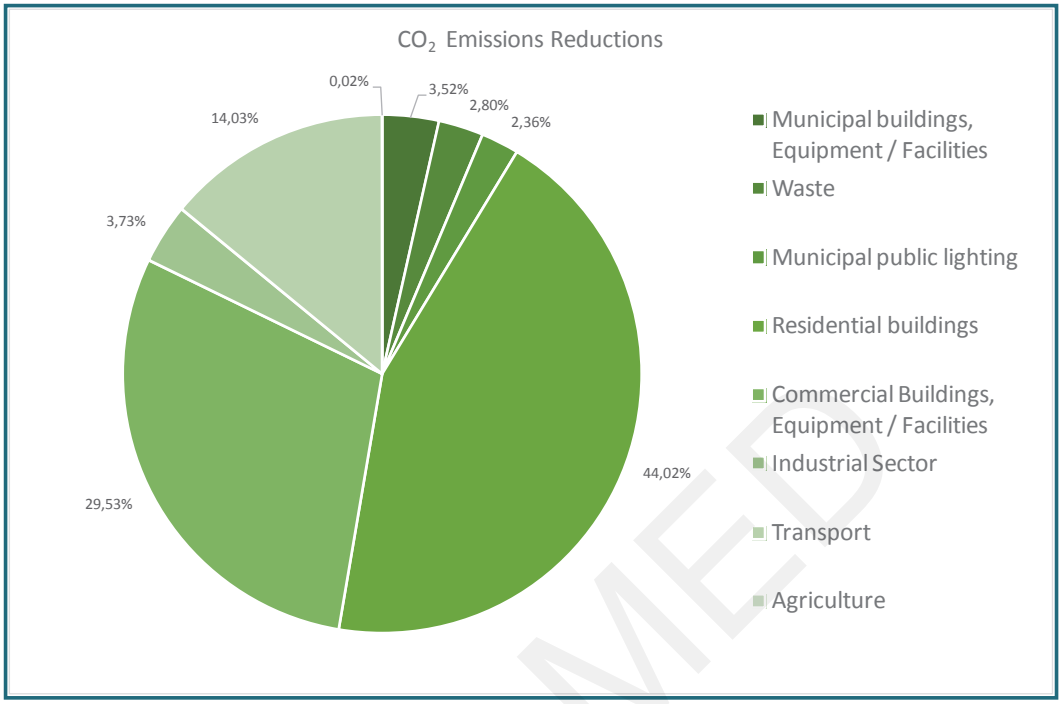

Figure 17 - Contribution per sector to the total CO_2 emission reduction

An overview table of the actions per sector, as well as the calculated emission reductions per action, is presented below.

Table 27 - Summary of the actions

Action No	Action	Emission Reductions (tn CO_2)
Municipal buildings, Equipment / Facilities		
1.1	Green procurement procedures for municipal buildings	133.80
1.2	Upgrading the municipal buildings' A/C and lighting systems	1,110.04
1.3	Energy Manager appointment in the Municipality	24.78
1.4	Energy refurbishment of selected municipal buildings as pilot projects	108.00
1.5	Use of cool colours in municipal buildings' roofs	247.78
1.6	Awareness raising activities for municipal employees	99.11
1.7	The 10% commitment campaign for schools	303.42
1.8	Awareness raising campaigns for pupils/ students	75.86
1.9	Promotion of recycling	1,441.44
1.10	Awareness raising campaigns to reduce the amounts of discarded food (reduction of the organic content of waste)	698.00
1.11	Installation of 700 kW PVs in municipal buildings' rooftops	504.00
Municipal public lighting		
2.1	Municipal lighting study	0.00
2.2	Municipal lighting system upgrade	1,493.40
Residential buildings		
3.1	The 10% voluntary commitment campaign	11,486.27

Action No	Action	Emission Reductions (tn CO_2)
3.2	Promotion of Green Buildings' concept	6,381.26
3.3	Campaign for substitution of old A/Cs and lamps	5,565.60
3.4	Information & awareness raising activities	3,892.57
3.5	Initiatives supporting citizens' actions	1,276.25
3.6	Establishment of the municipal team	1,914.38
3.7	3 MW Photovoltaic panels in residential rooftops	2,160.00
Commercial Buildings, Equipment / Facilities		
4.1	Seminars to professional groups	1,350.45
4.2	10% voluntary commitment campaign	8,102.69
4.3	Promotion of green buildings' concept	5,401.79
4.4	Other information and awareness raising activities	2,700.90
4.5	6 MW photovoltaic panels on building rooftops	4,320.00
Industrial Sector		
5.1	Subsidized energy audits at a volunteer basis	835.93
5.2	Targeted training seminars	278.64
5.3	10% voluntary commitment campaign	835.93
5.4	Switch to "cleaner" electricity provider	813.40
Transport		
6.1	Replacement of the municipal vehicles with new and more efficient	18.42
6.2	Efficient management of the municipal fleet	7.53
6.3	Maintenance of the municipal fleet	16.32
6.4	Eco-driving seminars for the municipal fleet's drivers	25.11
6.5	Awareness raising on new vehicle technologies	3,634.09
6.6	Transportation master plan	0.00
6.7	Increase the frequency of public transport routes	1,177.66
6.8	Cycling promotion and creation of related infrastructure	180.00
6.9	Promotion of walking, car sharing and car pooling campaigns	824.36
6.10	Adoption of real time information in public transport	400.00
6.11	Eco-driving promotion for professionals in private transportation	1,410.35
6.12	Promotion of new technology buses in the public transportation	915.02
6.13	Traffic congestion reduction through adoption of different timing of activities	1,782.62
Agriculture		
7.1	Awareness raising activities	16.50
TOTAL		73,963.66

Analysis of the suggested actions per sector is provided in the next sections. It should be noted that for awareness raising activities conducted by the municipality, besides the implementation cost born by the municipality and its potential funding sources, the amount of the private funds mobilized is reported as well where relevant. This cost doesn't participate in the calculation of the NPV value.

3.2 Municipal Buildings, Equipment / Facilities

Although the buildings and facilities of Rosh HaAyin Municipality contribute with almost 1.4% in the total emissions, there are several actions being suggested by the Municipality, since these facilities constitute one of the optimal sectors for the implementation of on the ground energy saving activities. In the following sections, a comprehensive set of actions is being analysed, in order to reduce the CO_2 emissions from this category. The envisaged actions for this sector include both energy conservation and green energy production measures, with emphasis on energy saving activities. It is considered that in Israel there are lot of opportunities to take advantage of the "low hanging fruit" in energy efficiency and PVs on building roofs are the most promising solution, since due to the

country's relatively small size, the establishment of RES facilities in need of space are especially difficult.

Apart from the above two, there is a third set of actions targeting the user through awareness raising activities. These activities not only try to set off a modification in the user's behaviour, but also to educate the younger generations in environmental and energy related issues.

The proposed actions are shown in the Table 28 below.

Table 28 - Proposed Actions for the Municipal Buildings, Equipment / Facilities

Action No	Action	Emission Reductions (tn CO_2)
1.1	Green procurement procedures for municipal buildings	133.80
1.2	Upgrading the municipal buildings' A/C and lighting systems	1,110.04
1.3	Energy Manager appointment in the Municipality	24.78
1.4	Energy refurbishment of selected municipal buildings as pilot projects	108.00
1.5	Use of cool colours in municipal buildings' roofs	247.78
1.6	Awareness raising activities for municipal employees	99.11
1.7	The 10% commitment campaign for schools	303.42
1.8	Awareness raising campaigns for pupils/ students	75.86
1.9	Promotion of recycling	1,441.44
1.10	Awareness raising campaigns to reduce the amounts of discarded food (reduction of the organic content of waste)	698.00
1.11	Installation of 700 kW PVs in municipal buildings' rooftops	504.00

3.2.1 Green procurement procedures for municipal buildings

Green procurement constitutes the procedure where the municipalities seek to procure goods and services with a reduced environmental impact throughout their life cycle. In this way selection of products and services that minimize environmental impacts takes place, including less energy consuming equipment. This action is envisaged for all energy consuming equipment and services purchased by the local authority of Rosh HaAyin, with emphasis on office equipment, lighting and air-conditioning.

It is considered that this action will apply on all related municipal purchases and could lead to 10% energy savings from the related municipal consumptions till 2020, through the purchase of new equipment of high efficiency standards when required, or the gradual substitution of aged energy consuming equipment with more efficient one.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability of the action are presented in Table 29. The cost estimation refers to the additional cost of the highly energy efficient products compared to the compatible solutions.

Table 29 - Action 1.1 in numbers

Action 1.1: Green procurement procedures	
Duration	2016-2020
Total Implementation Cost (NIS)	300,000 NIS
Annual Energy Savings (MWh)	223.00 MWh
Annual Emission Reduction (tn CO_2)	133.80 tn CO_2
Funding Source	Own sources
Net Present Value (NPV)	265,000 NIS

3.2.2 Upgrading the municipal buildings' A/C and lighting systems

According to studies, in a typical office building in Israel, lighting accounts for 30% of the overall electricity consumption. The climate conditions in Israel are especially challenging during the summer, characterized by high temperatures and humidity. For this reason, air conditioning (A/C) is the most significant energy consumer in buildings, with contribution percentages reaching up to 40% of the total office building energy consumption. The action foresees the gradual replacement of all existing lighting systems in the municipal buildings and sports facilities till 2020, with more efficient technologies such as LED lights. At the same time, simple automations will be installed, such as timers or movement sensors, in order to reduce electricity consumption occurring outside normal office working hours. In addition, the existing A/C systems will be renewed with highly efficient inverter systems. These initiatives are expected to contribute with 28% energy savings against the buildings' BAU lighting and A/C consumptions.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability of the action are presented in Table 30. The calculation of the NPV has been realised for the expected lifetime of the system, over a 10-year period. The initial cost refers to the additional cost incurred for investing in highly efficient equipment compared to the conventional choices.

Table 30 - Action 1.2 in numbers

Action 1.2: Upgrading the A/C and lighting in municipal buildings	
Duration	2014-2020
Total Implementation Cost (NIS)	2,500,000 NIS
Annual Energy Savings (MWh)	1,850.07 MWh
Annual Emission Reduction (tn CO_2)	1,110.04 tn CO_2
Funding Source	EU + Gov. (Min. of Energy)
Net Present Value (NPV)	2,200,000 NIS

3.2.3 Energy Manager appointment in the Municipality

One of the prerequisites of the municipality's adhesion to the Covenant of Mayors is the creation / adaptation of the municipal administrative structures, in order to establish the working team to implement and monitor the progress of the SEAP activities.

The energy manager will not only be the responsible person to monitor the energy consumptions and provide the necessary solutions when a problem is identified, but will act proactively in order to ensure the good coordination of the whole municipal team for the proper implementation of the envisaged SEAP actions.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability of the action are presented in Table 31. The benefits related to the energy manager's appointment are considered multi-dimensional since strong coordination of the overall initiative is required, although strictly economic indicators are not beneficial. In case a member of the existing municipality staff is appointed to this position, this will have even greater benefits to the municipality.

Table 31 - Action 1.3 in numbers

Action 1.3: Energy manager appointment in the Municipality	
Duration	2016-2020
Total Implementation Cost (NIS)	500,000 NIS
Annual Energy Savings (MWh)	41.30 MWh
Annual Emission Reduction (tn CO_2)	24.78 tn CO_2
Funding Source	Gov. (Min. of Energy, Interior)
Net Present Value (NPV)	< 0

3.2.4 Energy refurbishment of selected municipal buildings as pilot projects

In Israel exists the green buildings standard 5281/5282, which is not mandatory for any kind of building, including the public ones.

However, the role of the municipal authorities, as of all public authorities, is to lead by example. The specific action focuses on the energy refurbishment of selected municipal buildings with significant visual impact on the residents (e.g. municipal hall, administrative buildings etc.), in order not only to significantly reduce the energy cost of these establishments for the municipality, but more importantly to demonstrate to the citizens the different available energy efficient technologies in Israel and their results.

This energy refurbishment is suggested to include actions such as insulation of external walls, double glazing, installation of external shading, roof insulation, installation of simple automations such as thermostats and timers, etc. For the selected buildings, part of these actions will also be the upgrading of the lighting systems and the A/C, as described in the action 1.2 above. A significant part of the action will also be the display of explanatory labels on the realised actions in plain sight, accessible to all the passing by citizens, as well as digital signs showing the current energy consumption.

The energy refurbishment will be realised in at least 3 municipal buildings, among which one school, with an overall estimated energy savings of 30%.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability of the action are presented in Table 32 below.

Table 32 - Action 1.4 in numbers

Action 1.4: Energy refurbishment of selected municipal buildings as pilot projects	
Duration	2016-2020
Total Implementation Cost (NIS)	3,500,000 NIS
Annual Energy Savings (MWh)	180.00 MWh
Annual Emission Reduction (tn CO_2)	108.00 tn CO_2
Funding Source	EU+ Gov. (Min. of Energy, Environment, Building)
Net Present Value (NPV)	< 0

Although the action is not profitable, its benefits are not only in terms of reducing the buildings' energy costs, but also serve as pilot projects for the whole community, in order to demonstrate the available technological options.

3.2.5 Use of cool colours in municipal buildings' roofs

As mentioned above, the use of air conditioning constitutes one of the biggest energy consumptions in the buildings. One way to reduce this consumption in a cost efficient manner is through the adoption of cool colours for the buildings' roofs. Cool roofs cut cooling loads by up to 20 percent through the use of reflective materials that limit solar heat gain. In this action it is considered that they will contribute with a 10% reduction of the cooling loads. They are easily applied on the building since what is required is to paint the roofs with these cool colours. The action will be applied on 25,000m^2 of municipal roofs approximately.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability of the action are presented in Table 33.

Table 33 -- Action 1.5 in numbers

Action 1.5: Use of cool colours in municipal roofs	
Duration	2016-2020
Total Implementation Cost (NIS)	275,000 NIS
Annual Energy Savings (MWh)	412.96 MWh
Annual Emission Reduction (tn CO_2)	247.78 tn CO_2
Funding Source	EU + Gov. (Min. of Energy)
Net Present Value (NPV)	775,500 NIS

3.2.6 Awareness raising and training activities for municipal employees

A step of significant importance, in order to promote and achieve the planned initiatives, is to have properly communicated your intentions and plans to the people engaged in these activities. In this respect, this action comprises of a set of targeted awareness raising activities towards the municipal employees. The aim of these activities is to have the municipal employees as change agents, embrace them and change their behaviour and habits in order to achieve the envisaged results.

The set of awareness raising and training actions to be realised for the municipal employees of Rosh HaAyin includes the following:

- Training workshops and seminars for the team members directly involved in the SEAP implementation and monitoring. This activity aims at the capacity building regarding SEAP development and project implementation of the employees directly involved in the SEAP implementation team. These workshops and seminars could be targeted on how to attract financing from international donors, to manage the project implementation or even focus on the exchange of best practices and ideas with other municipalities in Israel and abroad that face the same challenges. Workshops on the latest available know how in terms of energy efficiency and RES technologies are envisaged as well.
- Development and circulation of promotional material through the employees' e-mails on the benefits of energy efficiency and how simple behaviour changes impact the total consumption.
- Municipal contest for the administrative building with the highest energy savings achieved (in terms of %) due to users' behaviour change. This contest prize could be any incentive provided to the employees, such as two additional days off that year or the development of posters with the pictures and names of the employees that contributed to the goal. The aim would be to achieve energy savings through strictly behavioural change, such as turning off the lights, the A/C and office equipment when leaving the office, not leave open windows with the A/C on etc. This measure could be used during the first couple of years, when the rest of the energy efficiency interventions will be gradually taking place.

Related calculations on the action, in terms of initial cost, energy and emission savings, are presented in Table 34. Such actions are more difficult to be quantified; however, it is considered that the financial viability of the action is ensured.

Table 34 - Action 1.6 in numbers

Action 1.6: Awareness raising and training activities for municipal employees	
Duration	2016-2020
Total Implementation Cost (NIS)	100,000 NIS
Annual Energy Savings (MWh)	165.18 MWh
Annual Emission Reduction (tn CO_2)	99.11 tn CO_2
Funding Source	Own sources
Net Present Value (NPV)	> 0

3.2.7 The 10% commitment campaign for schools

A set of actions focusing on schools is the 10% commitment campaign. This ambitious action will be realised in other energy consuming sectors as well and is targeted to promote the environmental consciousness and personal responsibility against the environment and society among the citizens across all age and professional groups.

This campaign is a volunteering action, where schools choose to commit to a target of at least 10% reduction. This action is strictly based on modification of the energy behaviour of the students and the teachers, without any investments on energy efficiency equipment. This campaign can also take the form of a contest between the different participating schools, on identifying the one achieving the highest energy saving percentage.

Schools will be educating the students through lessons and thematic energy days, where dedicated professionals will be invited as well to explain the benefits for the environment and the significance of preserving energy. Moreover, through all awareness raising and capacity building activities realised, school children will put the corner stone for building an environmental consciousness and adopt an energy efficient behaviour in their houses and as adults.

The achieved energy savings will be validated against the energy bills and the meters' readings, while the schools that achieve the commitment will receive an honorary praise. The school to win the contest and its students will receive the School Energy Cup by the Mayor in an open ceremony, while the financial resources saved for the municipality will be invested in the school for simple energy efficient projects (automations etc.).

It is envisaged that from the municipality's schools participating in the campaign, at least half of them will exceed the commitment target of 10% and the rest will achieve savings below this goal.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 35. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 35 - Action 1.7 in numbers

Action 1.7: The 10% commitment campaign for schools	
Duration	2016-2020
Total Implementation Cost (NIS)	100,000 NIS
Annual Energy Savings (MWh)	505.70 MWh
Annual Emission Reduction (tn CO_2)	303.42 tn CO_2
Funding Source	Own funding + Gov. (Ministries of Energy, Education, Environment)
Net Present Value (NPV)	> 0

3.2.8 Awareness raising campaigns for pupils and students

Apart from the suggested actions above, this action has been designed for additional actions for those schools that are looking for more ideas for keeping and improving their achievements. Awareness raising activities will be designed and carried out by the education department of the municipality, utilizing also the educational material available from the MIEW.

These actions include the development of explanatory brochures, the implementation of a thematic energy day, excursions to energy saving projects in the municipality to show case the technologies and their results, as well as a drawing or essay contest on what the environment and energy means to them.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 36. As an awareness raising activity, it is considered that the action is beneficial to the municipality against the related costs.

Table 36 - Action 1.8 in numbers

Action 1.8: Awareness raising campaigns for pupils and students	
Duration	2016-2020
Total Implementation Cost (NIS)	100,000 NIS
Annual Energy Savings (MWh)	126.43 MWh
Annual Emission Reduction (tn CO_2)	75.86 tn CO_2
Funding Source	Own funding + Gov. (Min. of Education, Environment)
Net Present Value (NPV)	> 0

3.2.9 Promotion of recycling

As waste contributes around 4% to the total municipal emissions, it is not considered a priority sector for the municipality of Rosh HaAyin, which has achieved very high recycling rates, amounting currently around 32%. However, the municipality remains dedicated in its activities to further promote recycling mainly through awareness activities, in order to achieve a 40% recycling rate by 2020. Although no energy savings will be achieved through this action, the estimated emission reductions will be approximately 8%.

Since the related infrastructure (installation of recycle bins, collection of waste for recycling) is already established, focus will be given in the existing part of the municipality on expanding the recycling network in the city limits, by increasing the density of the recycle bins and adding new ones in certain facilities such as schools, athletic facilities etc. It should also be highlighted that the municipal authorities in order to maintain this 40% recycling rate on the whole city, since the produced waste is expected to be doubled, along with the residents, need to more than double the existing infrastructure in the new part of the city as well. Moreover, broad dissemination activities, such as info days for the citizens, dissemination of messages through radio, newspapers and television, especially using local media, production of promotional material (leaflets, brochures, posters) and perhaps billboard advertisements will be realised in order to motivate the people. Special events for school children will be realized as well.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 37. The action is beneficial to the municipality against the related costs, since due to the waste volume reduction, a significant amount of landfilling fees is saved (550 NIS per tn of waste collected and landfilled), while the cost for collection of the waste for recycling is lower compared to the above mentioned.

Table 37 - Action 1.9 in numbers

Action 1.9: Promotion of recycling	
Duration	2013-2020
Total Implementation Cost (NIS)	3,500,000 NIS (500,000 NIS for the expansion in the old part of the city and 3,000,000 NIS for the new part of the city)
Annual Energy Savings (MWh)	0 MWh
Annual Emission Reduction (tn CO_2)	1,441.44 tn CO_2
Funding Source	Ministry of Environmental Protection + Municipal sources
Net Present Value (NPV)	> 0

3.2.10 Awareness raising campaigns to reduce the amounts of discarded food

In an additional effort to reduce emissions from waste, the municipality of Rosh HaAyin is planning to launch an awareness raising campaign on reducing the organic content of waste, especially targeting the amounts of food being discarded, contributing at the same time on the preservation of resources.

The awareness campaign will include the dissemination of messages through radio, newspapers and television, especially using local media, production of promotional material (leaflets, brochures, posters) and perhaps billboard advertisements. Special events for school children will be realized as well.

Although no energy savings will be achieved through this action, the estimated emission reductions will be approximately 5% compared to the BAU scenario.

This action is a key priority for the municipality and it is further developed as project fiche.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 38. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs, since due to the waste volume reduction, the transport and landfilling fees will be reduced.

Table 38 - Action 1.10 in numbers

Action 1.10: Reducing the organic content of waste	
Duration	2016-2020
Total Implementation Cost (NIS)	200,000 NIS
Annual Energy Savings (MWh)	0 MWh
Annual Emission Reduction (tn CO_2)	698 tn CO_2
Funding Source	Own funding + Ministry of Environment
Net Present Value (NPV)	>0

3.2.11 Installation of 700kW PVs in municipal buildings' rooftops

The solar energy potential for the country is one of the highest in the MEDA region, with the average amount of solar energy for Rosh HaAyin being 1,847 kWh/m^2.

Due to the relatively limited space in the region, no ground PVs are considered, with rooftop PVs being the optimal solution. The municipality is planning to utilise the rooftops in selected municipal buildings so as to install 700kW. The produced energy will be covering the buildings' needs, while the remaining amounts will be injected to the grid, in line with the net metering system.

The municipality will apply to International Financing Institutions (IFIs) and Donors in order to secure the necessary related financing.

The calculation of electricity production from PVs is realized according to the equation below:

$$E = A * r * H * PR$$

Where:

E: The electricity produced (kWh)

A: Total solar panel area (m^2)

r: Solar panel yield (Considered 15%)

H: Annual average solar radiation (1,847 kWh/m^2 for Rosh HaAyin)

PR: Performance ratio, considering losses (range between 0.5 – 0.9, default value 0.75)

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 39 below. It should be noted that the NPV is calculated during the lifetime of the PV panels, namely for 20 years.

Table 39 - Action 1.11 in numbers

Action 1.11 : 700 kW PVs in municipal rooftops	
Duration	2016-2020
Total Implementation Cost (NIS)	6,000,000 NIS
Annual Energy Savings (MWh)	840.00 MWh
Annual Emission Reduction (tn CO_2)	504.00 tn CO_2
Funding Source	Own funding + Loans (ESCO)
Net Present Value (NPV)	222,000 NIS

3.3 Municipal Public Lighting

The municipal public lighting sector consists of two main consumers, street and traffic lighting, with traffic lighting being almost negligible. Therefore, the suggested actions in this sector focus on street lighting, with the planned measures being low costs actions with immediate results.

Table 40 - Proposed Actions in the Municipal Public Lighting Sector

Action No	Action	Emission Reductions (tn CO_2)
2.1	Municipal lighting study	0.00
2.2	Municipal lighting system upgrade	1,493.40

3.3.1 Municipal lighting study

As the municipality of Rosh HaAyin doesn't currently have a municipal lighting study, it is considered a priority for the municipality since it will constitute the basis for the other actions to be implemented.

The study will be focusing on the lighting needs, identifying areas where light pollution phenomena may exist, against other areas in need of more lighting. At the same time, the luminosity of different types of lights bulbs in operation will be evaluated and verified through field visits and measurements with luxometers. Moreover, the study will focus on alternative technologies that could be utilised to offer the same lighting levels at lower consumptions, and evaluate their detailed economical behaviour, as well as the potential installation of light control systems.

The implementation of this study is not considered to derive direct energy savings and CO_2 reduction benefits, but it is seen as a prerequisite for the rest of the actions in the sector.

Some details regarding this activity are presented in the table below.

Table 41 - Action 2.1 in numbers

Action 2.1: Municipal lighting study	
Duration	2016
Total Implementation Cost (NIS)	100,000 NIS
Funding Source	Own sources

3.3.2 Municipal lighting system upgrade

Municipal lighting is one of the key contributors in the municipal consumptions and thus an area where efficiency measures can be broadly implemented. The specific action focuses on four axes and is based on the lighting study that should be conducted first:

- 1st axis: Better maintenance of the system. This activity focuses on the proper maintenance of the system, so that damaged light bulbs are replaced as soon as possible with new and more efficient ones.

- 2nd axis: Update of the lighting system infrastructure. The lighting systems in the municipality are considered very old and dysfunctional, facing wiring problems, outdated infrastructure etc. This axis is targeted at the gradual renewal of the whole infrastructure, where considered necessary.
- 3rd axis: Introduction of LED technology and gradual replacement of old light bulbs. This action relates to the gradual replacement of the current operating lamps, which are Mercury lamps of a variety of power (70W-1,000W), as soon as their lifetime is reached, with LED lamps, which are more efficient and have longer lifetime, sustaining at the same time the required brightness levels. Already the municipality is replacing some of the lamps with LEDs.
- 4th axis: Modification of the lighting grid's density. This action will lead to the more rational placement density of the lighting poles, especially in areas that are less densely populated, with the removal of redundant poles and the increase in their placement distance in the expansion areas of the lighting grid. Moreover, the introduction of LED technology can further result in the reduction of the light bulbs per pole, in order to have the same end result.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 42.

This action is a key priority for the municipality and it is further developed as project fiche.

Table 42 - Action 2.2 in numbers

Action 2.2: Municipal lighting system upgrade	
Duration	2014-2020
Total Implementation Cost (NIS)	9,540,300 NIS
Annual Energy Savings (MWh)	2,489 MWh
Annual Emission Reduction (tn CO_2)	1,493.40 tn CO_2
Funding Source	Loans (ESCO) + Government (Ministry of Energy)
Net Present Value (NPV)	2,182,430 NIS

3.4 Residential Buildings

The residential sector in Rosh HaAyin is the second highest energy consumer and emitter, with almost 31% of the total municipal consumptions. Although, the Municipality does not have the possibility of direct interventions in terms of projects' realization for the reduction of the homes' energy footprint, it is planning a series of actions in order to inform, educate, raise awareness and support the citizens in their activities.

The list of planned actions for the residential sector in the Municipality of Rosh HaAyin is presented in Table 43 below.

Table 43 - Proposed Actions for the Residential Buildings

Action No	Action	Emission Reductions (tn CO_2)
3.1	The 10% voluntary commitment campaign	11,486.27
3.2	Promotion of Green Buildings' concept	6,381.26
3.3	Campaign for substitution of old A/Cs and lamps	5,565.60
3.4	Information & awareness raising activities	3,892.57
3.5	Initiatives supporting citizens' actions	1,276.25
3.6	Establishment of the municipal team	1,914.38
3.7	3 MW Photovoltaic panels in residential rooftops	2,160.00

3.4.1 The 10% voluntary commitment campaign

This revolutionary campaign to be promoted across the different energy consuming sectors (residential, tertiary, industrial) in the whole municipality is an effort to increase the sense of responsibility towards the environment and the community, among the citizens in this case, by establishing an environmental consciousness.

The municipality will launch this program as a voluntary campaign, where citizens can participate in order to reduce their home's energy and carbon footprint, and more importantly to reduce their electricity bill, thus saving some money for the monthly family budget. This action is targeted to single homes or apartment buildings, each one identified as a single user.

The user will be able to fill in an application form (potentially online through the municipality's website) in order to participate in the program, accompanied with the last year's electricity bills for the respective house (apartment or building). During the year he will be given priority to participate in all educational and informational events organized by the municipality with advice on how to reduce energy consumption in the house with simple actions and change of his behaviour, and he will be sent brochures with this material as well. At the end of the year, the user will submit his electricity bills once more in order to prove a 10% at least of energy savings.

The municipality will organise a ceremony for all participants in the program and will provide honorary certificates to those who achieved the target of 10% reductions, while it will publish their names in the local newspapers and /or magazines, as an example.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 44. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 44 - Action 3.1 in numbers

Action 3.1: The 10% voluntary commitment campaign	
Duration	2016-2020
Total Implementation Cost (NIS)	750,000 NIS
Annual Energy Savings (MWh)	19,143.79 MWh
Annual Emission Reduction (tn CO_2)	11,486.27 tn CO_2
Funding Source	EU+ Gov. (Ministries of Energy, Environment)
Net Present Value (NPV)	> 0

3.4.2 Promotion of green buildings' concept

The lack of mandatory application of the green building code of practice in Israel is one of the key issues behind the moderate energy behaviour of buildings in the country.

This action is targeted towards the promotion of specific elements of the green buildings' concept, that can be applied in existing or new buildings as well, with the target that the rates with which citizens adopt such types of measures will be increased. Special focus will be placed on promoting this concept among those citizens interested to move in the part of the new city being built, as well as the constructing companies engaged in this activity.

Customised sets of potential interventions and actions will be suggested to the citizens through info days and awareness activities in the local media (local newspapers, TV and radio), as well as distribution of dissemination material (flyers, brochures etc.). These interventions will mainly target the existing buildings on the need to install shadings in the southern glazing and roof insulation, as well as paint the buildings' facade and roofs with cool colours, that reduce thermal absorption. For the new buildings, where required changes can be realised from the design phase, emphasis will be placed on the optimal orientation of the building, the need for increased natural lighting and natural ventilation, the inclusion of a minimum level of insulation in the buildings' exterior surfaces (walls and roof), as

well as shading in the glazing. In addition to the above the use of cool colours will also contribute significantly to the reduction of energy losses. All these suggested activities will be accompanied by a brief cost estimation and analysis, explaining their benefits to the citizens not only from the improvement of living conditions in the house point of view, but more importantly from their contribution in decreasing energy related costs and bills.

At the same time, meetings and workshops will be realised with the construction companies' representatives, highlighting the importance for the Mayor and the municipality of green principles' adoption in the newly erected buildings.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 45 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs, while it is also financially beneficial for the residents.

This action is a key priority for the municipality and it is further developed as project fiche.

Table 45 - Action 3.2 in numbers

Action 3.2: Promotion of green buildings' concept	
Duration	2016-2020
Total Implementation Cost (NIS)	250,000 NIS
Expected Private Funds Mobilized (NIS)	69,000,000 NIS
Annual Energy Savings (MWh)	10,635.44 MWh
Annual Emission Reduction (tn CO_2)	6,381.26 tn CO_2
Funding Source	Own funding + Gov. (Ministries of Energy, Environment, Building)
Net Present Value (NPV)	> 0

3.4.3 Campaign for substitution of old A/Cs and lamps

Air-conditioning (A/C) and lighting are the highest energy consumers in the residential sector.

According to the National Energy Efficiency Program – Reducing electricity consumption 2010-2020, by the Ministry of National Infrastructures, Energy and Water Resources in Israel, the expected annual energy savings per household due to the use of energy efficient A/Cs following the regulation change, as of 2012, is estimated at 1,344 kWh. As concerns the lamps, according to the same study, an average household in Israel has 5 bulbs, with an average of 87.5 W each, which can be replaced with an average of 16.5 W each.

The municipality of Rosh HaAyin will work closely with the MIEW, which has provided financial motives in the past for the substitution of domestic appliances (e.g. A/C, fridges), so that the purchase of a new A/C and lamps with the simultaneous retraction of the old appliances will be subsidized for at least 4,000 households regarding the A/Cs and 6,000 regarding the light bulbs, at a percentage of 30%.

The municipality will undertake the awareness raising of the citizens on this initiative and the coordination of this action, in close collaboration with the engaged Ministry. Related calculations on the action in terms of initial cost and emission savings are presented in Table 46.

Table 46 - Action 3.3 in numbers

Action 3.3: Campaign for highly efficient A/Cs and lamps in houses	
Duration	2016-2020
Total Implementation Cost (NIS)	4,000,000 NIS
Expected Private Funds Mobilised (NIS)	9,300,000 NIS
Annual Energy Savings (MWh)	9,276.00 MWh
Annual Emission Reduction (tn CO_2)	5,565.60 tn CO_2
Funding Source	EU + Government (Min. of Energy)
Net Present Value (NPV)	> 0

3.4.4 Information and awareness raising activities

Apart from the specifically thematic targeted awareness raising activities mentioned above, this action is of broader character, as it addresses all residents. Its aim is to enhance the environmental consciousness of the citizens through the following activities:

- Organization of "Energy days", in line with its participation in the Covenant of Mayors initiative. In these energy days the importance of energy saving and protecting the environment will be stressed, through simple actions such as modification of the energy behaviour, changing incandescent lamps with fluorescent or LED lamps, importance of purchasing high energy class appliances, installation of solar panels for water heating in existing buildings etc.
- Projection of freely available environmental documentaries on the World Environment day on the 5th of June. Some documentaries that could be alternatively projected include:
    - "Home" documentary, a 2009 film by Yann Arthus-Bertrand.
    - "The Nature of Cities", a 2010 documentary by Chuck Davis and Tim Beatley.
    - "Power to the people", a 2015 documentary and many more.
- Participation in "Earth hour" event by WWF, where people across the world turn their lights off for one hour on a designated day.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 47. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 47 - Action 3.4 in numbers

Action 3.4: Information and awareness raising activities	
Duration	2016-2020
Total Implementation Cost (NIS)	150,000 NIS
Annual Energy Savings (MWh)	6,487.62 MWh
Annual Emission Reduction (tn CO_2)	3,892.57 tn CO_2
Funding Source	Own funding + Gov. (Min. of Energy, Environment)
Net Present Value (NPV)	> 0

3.4.5 Initiatives supporting citizens' actions

Having described in the above sections the activities the municipality of Rosh HaAyin will realize to stimulate energy savings among the citizens, this action is targeted to the initiatives realized to actively support the citizens in these actions.

Coordination and "soft" awareness raising activities are considered two important elements to facilitate the promotion and implementation of the above mentioned actions.

In this respect, the municipality will use its website for the coordination of these activities, announcing events that are going to be organised in a calendar, bringing together groups of concerned citizens through an official forum and offering advice and know how on line through this portal.

On the other hand, the municipality will prepare a number of leaflets, brochures, posters, animation videos and information material in general on the importance of energy and energy savings, and advice on how energy can be used more efficiently on a daily basis in the citizens' routine activities. All this material will also be available online, through the municipality's website.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 48.

Table 48 - Action 3.5 in numbers

Action 3.5: Initiatives supporting citizens' actions	
Duration	2016-2020
Total Implementation Cost (NIS)	75,000 NIS
Annual Energy Savings (MWh)	2,127.09 MWh
Annual Emission Reduction (tn CO_2)	1,276.25 tn CO_2
Funding Source	Own funding
Net Present Value (NPV)	> 0

3.4.6 Establishment of the municipal team

As mentioned before, coordination is considered very important for the attainment of the set goals in these awareness raising activities. For this reason, apart from the municipality's obligation under the CoM to appoint the persons administratively responsible to follow up and implement the SEAP activities, the municipality will further enforce this team with additional personnel, especially from the technical service and educational departments. Objective is to offer the citizens technical advice, and where possible also legal and financial one, on the energy efficiency measures and projects that they intend to do in their households.

An Energy Efficiency Department is thus going to be created in order to offer this support to the civilians with a team that has high knowledge in energy efficiency and conservation projects and measures. The department will also offer advice based on the other proposed measures of the municipality.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 49.

Table 49 - Action 3.6 in numbers

Action 3.6: Establishment of the municipal team (Energy Efficiency Department)	
Duration	2016-2020
Total Implementation Cost (NIS)	1,750,000 NIS
Annual Energy Savings (MWh)	3,190.63 MWh
Annual Emission Reduction (tn CO_2)	1,914.38 tn CO_2
Funding Source	Gov. (Min. of Energy, Environment, Interior)
Net Present Value (NPV)	> 0

3.4.7 3MW Photovoltaic panels on residential rooftops

The high levels of solar energy potential in the area of the Municipality favour the installation of photovoltaic panels on roofs of residential buildings. An information campaign targeted to promote the installation of PVs on residential rooftops will be conducted, combined to the coordination and awareness raising activities mentioned before.

Related calculations on the action are presented in Table 50 below, in line with the method presented under the municipal sector PVs. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs. It should be noted that the investment for an average household is considered marginally beneficial in the 20-year life span. However, considering that energy prices will go up within this period, this is definitely an investment worth thinking of.

Table 50 - Action 3.7 in numbers

Action 3.7: 3MW Photovoltaics in residential rooftops	
Duration	2016-2020
Total Implementation Cost (NIS)	100,000 NIS
Expected Private Funds Mobilised (NIS)	25,000,000 NIS
Annual Energy Savings (MWh)	3,600.00 MWh
Annual Emission Reduction (tn CO_2)	2,160.00 tn CO_2
Funding Source	Own sources
Net Present Value (NPV)	> 0

3.5 Commercial Buildings, Equipment / Facilities

Commercial buildings/equipment and facilities is the highest sector concerning the GHG emissions. As in the case of the residential sector, the Municipality does not have the possibility of direct interventions in terms of projects' realization for the reduction of the sector's energy and carbon footprint; however, it is planning a series of actions in order to inform, educate, raise awareness and support the related stakeholders in their activities.

The list of planned actions for the commercial sector in the Municipality of Rosh HaAyin is presented in Table 51 on the next page.

Table 51 - Proposed Actions for the Commercial Buildings, Equipment / Facilities

Action No	Action	Emission Reductions (tn CO_2)
4.1	Seminars to professional groups	1,350.45
4.2	10% voluntary commitment campaign	8,102.69
4.3	Promotion of green buildings' concept	5,401.79
4.4	Other information and awareness raising activities	2,700.90
4.5	6 MW photovoltaic panels on building rooftops	4,320.00

3.5.1 Seminars to professional groups

Lifelong learning activities are a key for the continuous evolvement of citizens and the society. Based on this fact, and taking into consideration the contribution the tertiary sector has on the municipality's carbon footprint, the municipality intends to organize a series of seminars to targeted professional groups in order to promote the concept of energy management and energy saving practices and provide advice on ways to improve at low cost the energy efficiency of the related buildings and facilities.

The municipality of Rosh HaAyin is orientated towards the realization of a series of seminar rounds, where in each seminar a different group of interested stakeholders will participate. These seminars will be differentiated depending on the size of the group of stakeholders being represented, so different solutions will be suggested for small buildings/ shops/ companies, and alternative options will be provided for medium or large size ones.

Since key energy consumers in buildings of the tertiary sector are mainly HVAC and lighting, whose consumption is highly determined by the energy behaviour of the buildings and facilities' users, suggested technical solutions per group of stakeholders may include simple modification of the users' energy behaviour, installation of automations and thermostats, increase of natural light and natural ventilation, use of cool colours, replacement of incandescent or fluorescent lamps with LED etc.

The stakeholders will express interest to participate in one of these free of charge seminars through an online application form, and they will be notified depending on their characteristics (size, building use etc.) on potential dates they can attend the seminar, when the groups are complete. It is

considered that over the years at least a 10% of the stakeholders activated in the sector will attend the seminars, achieving through low or no cost actions a 10% energy reduction in their facilities.

This action is a key priority for the municipality and it is further developed as project fiche.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 52 below.

Table 52 - Action 4.1 in numbers

Action 4.1: Seminars to professional groups	
Duration	2016-2020
Total Implementation Cost (NIS)	600,000 NIS
Expected Private Funds Mobilized (NIS)	1,750,000 NIS
Annual Energy Savings (MWh)	2,250.75 MWh
Annual Emission Reduction (tn CO_2)	1,350.45 tn CO_2
Funding Source	Own funding + Gov. (Ministries of Economics, Energy)
Net Present Value (NPV)	> 0

3.5.2 10% voluntary commitment campaign

As in the case of the residential sector and schools, the municipality will launch this program as a voluntary campaign, where shop and business owners can participate in order to reduce their facilities' energy and carbon footprint, and more importantly to reduce their electricity bill. An additional reward for those achieving the target, compared to the residential sector campaign, will be the conferment of the "Energy friendly business label", which will be adopted as a marketing campaign by the municipality. In this way, businesses achieving their set targets will be able to display such a label as a sign of corporate responsibility.

The interested stakeholders will be able to fill in an application form (potentially online through the municipality's website) in order to participate in the program, accompanied with the last year's electricity bills for the respective facilities (offices, shops, etc.). During the year, they will be given priority to participate in all educational and informational events organized by the municipality with advice on how to reduce energy consumption in their premises with simple actions and they will be sent brochures with this material as well. At the end of the year, the users will submit their electricity bills once more in order to prove a 10% at least of energy savings.

The municipality will organise a ceremony for all participants in the program and will provide the "Energy friendly business label" to those who achieved the target of 10% reductions, while it will publish their brands' names in the local newspapers and /or magazines, as an example.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 53 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 53 - Action 4.2 in numbers

Action 4.2: 10% voluntary commitment campaign	
Duration	2016-2020
Total Implementation Cost (NIS)	700,000 NIS
Annual Energy Savings (MWh)	13,504.48 MWh
Annual Emission Reduction (tn CO_2)	8,102.69 tn CO_2
Funding Source	Own funding + Gov. (Min. of Economics, Energy)
Net Present Value (NPV)	> 0

3.5.3 Promotion of green buildings' concept

This action is targeted towards the promotion of specific elements of the green buildings' concept that can be applied in existing or new buildings, with the target that the rates with which business owners adopt such types of measures will be increased.

Customised sets of potential interventions and actions will be suggested to the business owners through info days and awareness activities in the local media (local newspapers, TV and radio), as well as distribution of dissemination material (flyers, brochures etc.). These interventions will be mainly tailored for the existing buildings on the need to install shadings in the southern glazing and roof insulation, as well as paint the buildings' facade and roofs with cool colours, that reduce thermal absorption. For the new buildings, where required changes can be realised from the design phase, emphasis will be placed on the optimal orientation of the building, the need for increased natural lighting and natural ventilation, the inclusion of a minimum level of insulation in the buildings' exterior surfaces (walls and roof), as well as shading in the glazing. In addition to the above, the use of cool colours will also contribute significantly to the reduction of energy losses. All these suggested activities will be accompanied by a brief cost estimation and analysis, explaining their benefits not only from the improvement of living conditions point of view, but more importantly from their contribution in decreasing energy related costs and bills.

Moreover, the municipality will liaise with the representatives of the constructing companies, as new shops will be built in the new part of the city, in order to build them as energy efficient as possible. These meetings for the tertiary sector will be combined with those to be conducted for the residential sector, under the corresponding action.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 54 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 54 - Action 4.3 in numbers

Action 4.3: Promotion of green buildings' concept	
Duration	2016-2020
Total Implementation Cost (NIS)	150,000 NIS
Expected Private Funds Mobilised (NIS)	10,500,000 NIS
Annual Energy Savings (MWh)	9,002.99 MWh
Annual Emission Reduction (tn CO_2)	5,401.79 tn CO_2
Funding Source	Own Funding + Gov. (Min. of Energy, Economics, Building)
Net Present Value (NPV)	> 0

3.5.4 Other information and awareness raising activities

Apart from organising seminars, design and distribution of informative leaflets and brochures relevant to projects and funding schemes that act in favour of energy efficiency and green energy production is being planned. Design of informative material is of outmost importance for the dissemination of ideas that can change the energy behaviour of the commercial sector.

The informative material will be produced and renewed several times each year, and will cover different aspects and directions in the energy efficiency and emission reduction. Case studies that act as prototypes will be included in the informative material, to encourage the commercial sector to reproduce exemplary actions.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 55 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 55 - Action 4.4 in numbers

Action 4.4: Other information and awareness raising activities	
Duration	2016-2020
Total Implementation Cost (NIS)	100,000 NIS
Annual Energy Savings (MWh)	4,501.49 MWh
Annual Emission Reduction (tn CO_2)	2,700.90 tn CO_2
Funding Source	Own funding + Min. of Economics
Net Present Value (NPV)	> 0

3.5.5 6 MW Photovoltaic panels on building rooftops

As mentioned before, the high levels of solar energy potential in the area of the Municipality favour the installation of photovoltaic panels on roofs of tertiary sector buildings. An information campaign targeted to promote the installation of PVs on these rooftops will be conducted, combined to the coordination and awareness raising activities mentioned above.

Related calculations on the action are presented in Table 56, in line with the method presented under the municipal sector PVs. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs. It should be noted that the investment for an average size PV is considered beneficial in the 20 year life span, especially if one takes into account that energy prices will go up within this period.

Table 56 - Action 4.5 in numbers

Action 4.5: 6 MW Photovoltaic panels on rooftops	
Duration	2016-2020
Total Implementation Cost (NIS)	50,000 NIS
Expected Private Funds Mobilised (NIS)	50,000,000 NIS
Annual Energy Savings (MWh)	7,200.00 MWh
Annual Emission Reduction (tn CO_2)	4,320.00 tn CO_2
Funding Source	Own Funding
Net Present Value (NPV)	> 0

3.6 Industrial Sector

The industrial sector is responsible for about 7% of carbon emissions in the area of Rosh HaAyin.

Table 57- Proposed Actions for the Industrial Sector

Action No	Action	Emission Reductions (tn CO_2)
5.1	Subsidized energy audits at a volunteer basis	835.93
5.2	Targeted training seminars	278.64
5.3	10% voluntary commitment campaign	835.93
5.4	Switch to “cleaner” electricity provider	813.40

3.6.1 Subsidized energy audits at a volunteer basis

The Israeli legal framework does not obligate the industries in periodic energy audits. However, energy audits are a powerful tool in order to address the issue of low energy efficiency and related GHG emissions, since they can be used to identify the key areas allowing significant energy savings with simple actions of low or medium cost.

In this respect, the municipality of Rosh HaAyin is planning to realize a program where subsidized energy audits will be offered to stakeholders from the industrial sector. These audits will be offered with the stakeholders' commitment that they are going to implement at least two low cost measures in order to improve their energy consumption profiles.

Efforts will be made by the municipality to ensure the necessary financing for this action in the framework of a state funded program, as those launched by the MIEW.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 58 below.

Table 58- Action 5.1 in numbers

Action 5.1: Subsidized energy audits at a volunteer basis	
Duration	2016-2020
Total Implementation Cost (NIS)	750,000 NIS
Expected Private Funds Mobilized (NIS)	1,400,000 NIS
Annual Energy Savings (MWh)	1,393.21 MWh
Annual Emission Reduction (tn CO_2)	835.93 tn CO_2
Funding Source	EU+ Government Large Scale Industries: Ministry of Energy, Small and Medium Industries: Min. of Economics
Net Present Value (NPV)	> 0

3.6.2 Targeted training seminars

Similar to the tertiary sector, the municipality of Rosh HaAyin is orientated towards the realization of a series of seminar rounds, where in each seminar a different group of interested stakeholders will participate. These seminars will be differentiated depending on the size of the group of stakeholders being represented, so different solutions will be suggested for small industries, and alternative options will be provided for medium or large size ones. The areas these industries are activated are also very important for their grouping into different categories, since the production procedure of each industry may be largely differentiated depending on the end product. The buildings of these industries will also be taken into consideration in these seminars.

The stakeholders will express interest to participate in one of these free of charge seminars through an online application form, and they will be notified depending on their characteristics (size, building use etc.) on potential dates they can attend the seminar, when the groups are complete. It is considered that over the years at least 40% of the stakeholders activated in the sector will attend the seminars, achieving through low or no cost actions a 5% energy reduction in their facilities.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 59.

Table 59 - Action 5.2 in numbers

Action 5.2: Targeted training seminars	
Duration	2016-2020
Total Implementation Cost (NIS)	120,000 NIS
Annual Energy Savings (MWh)	464.40 MWh
Annual Emission Reduction (tn CO_2)	278.64 tn CO_2
Funding Source	Own funding + Min. of Economics
Net Present Value (NPV)	> 0

3.6.3 The 10% voluntary commitment campaign

Similar to the tertiary sector, the municipality will launch this program as a voluntary campaign, where stakeholders from the industrial sector can participate in order to reduce their facilities' energy and carbon footprint, and more importantly to reduce their energy cost. The "Energy friendly business label" will be applicable to this group as well. In this way, businesses achieving their set targets will be able to display such a label as a sign of corporate responsibility.

The interested stakeholders will be able to fill in an application form (potentially online through the municipality's website) in order to participate in the program, accompanied with the last year's electricity bills for the respective facilities. During the year, they will be given priority to participate in all educational and informational events organized by the municipality with advice on how to reduce energy consumption in their premises with simple actions and they will be sent brochures with this material as well. At the end of the year, the users will submit their electricity bills once more in order to prove a 10% at least of energy savings.

The municipality will organise a ceremony for all participants in the program and will provide the "Energy friendly business label" to those who achieved the target of 10% reductions, while it will publish their brands' names in the local newspapers and /or magazines, as an example.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 60 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 60 - Action 5.3 in numbers

Action 5.3: The 10% voluntary commitment campaign	
Duration	2016-2020
Total Implementation Cost (NIS)	120,000 NIS
Annual Energy Savings (MWh)	1,393.21 MWh
Annual Emission Reduction (tn CO_2)	835.93 tn CO_2
Funding Source	Own funding
Net Present Value (NPV)	> 0

3.6.4 Switch to "cleaner" electricity provider

Following the identification of significant natural gas reserves in the country, the IEC has started gradually integrating the natural gas into the fuel mix for electricity generation. On the other hand, although the Israeli electricity market is not deregulated, there are few private companies activated in electricity production, based entirely on natural gas. It was recently decided by law that large industrial consumers have the right to switch their electricity provider, if they wish so. It is thus considered that for Rosh HaAyin Municipality, the eligible number of companies that will proceed in this switch represents at least 10% of the sector's consumptions.

The action bears no cost for the municipality, and no energy savings, since the reductions in the CO_2 emissions are calculated as the difference between the two emission factors.

Related information on the action is presented in Table 61 below.

Table 61 - Action 5.4 in numbers

Action 5.4: Switch to "cleaner" electricity provider	
Duration	2016-2020
Total Implementation Cost (NIS)	0 NIS
Annual Energy Savings (MWh)	0 MWh
Annual Emission Reduction (tn CO_2)	813.40 tn CO_2

3.7 Transport

Transportation is the third largest energy consumer and GHG emitter in the municipality of Rosh HaAyin. The proposed activities are targeted on the municipal fleet and the private and public transportation.

Table 62 - Proposed actions for Transport

Action No	Action	Emission Reductions (tn CO_2)
6.1	Replacement of the municipal vehicles with new and more efficient	18.42
6.2	Efficient management of the municipal fleet	7.53
6.3	Maintenance of the municipal fleet	16.32
6.4	Eco-driving seminars for the municipal fleet's drivers	25.11
6.5	Awareness raising on new vehicle technologies	3,634.09
6.6	Transportation master plan	0.00
6.7	Increase the frequency of public transport routes	1,177.66
6.8	Cycling promotion and creation of related infrastructure	180.00
6.9	Promotion of walking, car sharing and car pooling campaigns	824.36
6.10	Adoption of real time information in public transport	400.00
6.11	Eco-driving promotion for professionals in private transportation	1,410.35
6.12	Promotion of new technology buses in the public transportation	915.02
6.13	Traffic congestion reduction through adoption of different timing of activities	1,782.62

3.7.1 Replacement of the municipal vehicles with new and more efficient

The municipal fleet in Rosh HaAyin constitutes of 41 vehicles, mainly of passenger type.

The purchase of more efficient, and lower horsepower vehicles, as well as hybrid (electricity and gasoline) vehicles may significantly contribute to fuel savings, which can rise up to 50% of the initial consumption. The energy and financial efficiency of such vehicles is well documented and proven by the vehicles constructors themselves. Especially in the Municipality of Rosh HaAyin, the option of hybrid with natural gas as a fuel is also available, due to the availability of the natural gas network in the region. The municipality will make sure that adequate infrastructure in the gas stations exist for the supply of the vehicles.

In particular, this action envisages the gradual replacement of gasoline cars with more efficient ones (diesel, hybrid electricity of hybrid natural gas) for five of the oldest and most energy consuming cars of the municipal fleet. For the feasibility study of the action, the surplus initial cost against a compatible car is taken into consideration. For the financing of the action, the use of national resources is considered necessary.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 63.

Table 63 - Action 6.1 in numbers

Action 6.1: Replacement of the municipal vehicles with new and more efficient	
Duration	2016-2020
Total Implementation Cost (NIS)	1,620,000 NIS
Annual Energy Savings (MWh)	73.50 MWh
Annual Emission Reduction (tn CO_2)	18.42 tn CO_2
Funding Source	National funds + own sources
Net Present Value (NPV)	< 0

3.7.2 Efficient management of the municipal fleet

The registration and planning of the vehicles' routes in the municipal fleet can lead to significant energy savings and related reduction of the CO_2 emissions. Installing GPS systems in the municipal fleet cars and the program for overseeing them is a tool to this direction, supporting the better programming, monitoring and evaluation of the conducted routes. A result of such programming could be the modification of routes, confirmation that the conducted use is in line with the municipality's responsibilities, use of motorbikes for the municipality's needs where possible etc.

Also, cultivation of an energy saving culture to the municipal employees, in order to avoid the use of municipal vehicles for short routes inside the city, should be a priority. A reduction of 3% of the energy consumptions is expected as a result of this activity.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 64.

Table 64 - Action 6.2 in numbers

Action 6.2: Efficient management of the municipal fleet	
Duration	2016-2020
Total Implementation Cost (NIS)	80,000 NIS
Annual Energy Savings (MWh)	30.03 MWh
Annual Emission Reduction (tn CO_2)	7.53 tn CO_2
Funding Source	Own funding
Net Present Value (NPV)	12,600.00 NIS

3.7.3 Maintenance of the municipal fleet

Regular and proper maintenance of the municipal fleet can yield significant energy savings, ensure the proper operation of the vehicles and prevent costly damages.

Although the municipal fleet is currently being maintained, the municipality will ensure that this is realised in a better organised manner, giving priority to vehicles that are in more frequent use, while ensuring that all related service works are conducted on time.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 65 below.

Table 65 - Action 6.3 in numbers

Action 6.3: Municipal fleet maintenance	
Duration	2016-2020
Total Implementation Cost (NIS)	200,000 NIS
Annual Energy Savings (MWh)	65.06 MWh
Annual Emission Reduction (tn CO_2)	16.32 tn CO_2
Funding Source	Own funding
Net Present Value (NPV)	> 0

3.7.4 Eco-driving seminars for the municipal fleet's drivers

The adoption of eco-driving principles by drivers is considered as a good way to significantly decrease a car's consumption. However, in order to be effective, simple advice to the drivers is not enough; specialized eco-driving training seminars should be realised. According to studies, these trainings lead to consumption reduction of up to 20% directly after training and about 5% in the long run.

The municipality intends to organize a series of seminars for all the drivers of the municipal fleet, and make sure that each driver will have to repeat the seminars every two years, in order to ensure the effect of the activity.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 66. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 66 - Action 6.4 in numbers

Action 6.4: Eco-driving seminars for the drivers of the municipal fleet and better planning of routes	
Duration	2016-2020
Total Implementation Cost (NIS)	150,000 NIS
Annual Energy Savings (MWh)	100.10 MWh
Annual Emission Reduction (tn CO_2)	25.11 tn CO_2
Funding Source	Own funding+ Gov. (Min. of Energy, Transportation, Environment)
Net Present Value (NPV)	> 0

3.7.5 Awareness raising on new vehicle technologies

Private cars are the most significant contributor in the transport sector, as one would expect. This action focuses on different awareness raising activities in order to promote new vehicle technologies and achieve a higher rate of old cars' replacement. Info days will be realised in close coordination with car dealers, in order to exhibit the most energy efficient models from numerous car brands, with emphasis also on hybrid cars. Appropriate dissemination material (brochures, flyers, posters etc.) will be designed and developed in order to provide figures and facts on the benefits of using newer technology vehicles. At the same time, additional motives can be provided by the municipality to the owners of hybrid vehicles, such as free parking in municipality controlled parking spaces etc.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 67. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 67 - Action 6.5 in numbers

Action 6.5: Awareness raising on new vehicle technologies	
Duration	2016-2020
Total Implementation Cost (NIS)	500,000 NIS
Expected Private Funds Mobilized (NIS)	275,000,000 NIS
Annual Energy Savings (MWh)	14,290.94 MWh
Annual Emission Reduction (tn CO_2)	3,634.09 tn CO_2
Funding Source	Own funding + Gov. (Min. of Transportation, Energy, Environment)
Net Present Value (NPV)	> 0

3.7.6 Transportation master plan

The transportation master plan is the key to success for all activities envisaged in the transportation sector, so that the activities are coherent and not simply segmented ideas. In this respect, this master plan constitutes the city's blueprint for planning, developing and operating its walking, cycling, transit and road networks over the coming decades, it's horizon being not only 2020.

The plan has a twofold objective. On one hand to improve mobility and access in the city in a way that is safe and convenient and on the other hand to do so by minimizing auto congestion, air pollution, and noise.

Key areas of focus for the current plan will include integrating the concept of complete streets, updating modal share targets, advancing strategies to improve walking and cycling, and supporting transit-oriented development. The plan will also identify a number of modifications to road and transit

infrastructure priorities to account for adjustments in growth patterns, emerging issues and strategic opportunities.

The implementation of this study is not considered to derive direct energy savings and CO_2 reduction benefits, but it is seen as a prerequisite for the rest of the actions in the sector.

Some details regarding this activity are presented in the table below.

Table 68 - Action 6.6 in numbers

Action 6.6: Transportation master plan	
Duration	2014-2016
Total Implementation Cost (NIS)	500,000 NIS
Funding Source	Own funding + Gov. (Min. of Transportation)

3.7.7 Increase the frequency of public transport routes

Public transportation is not considered good in the municipality of Rosh HaAyin, so there is significant room for improvement.

The master plan intends to identify all the routes that are not adequately serviced so far, in order to establish new bus routes, and to increase the frequency of the existing ones. Among the new bus routes for consideration are the connection to the highway, and also the inclusion of bus stops outside primary and secondary schools and an increase in their frequency during the start and ending hours of schools' operation. School related mobility is closely connected with the municipality's priority on increasing the pupils' mobility in a safe manner, reducing on the other hand the congestion created by parents' cars picking up their children. In this aspect, the routing of school buses, or "pedestrian" school buses where at least two adults will accompany children to school could be considered. Additional modifications to increase the transit possibilities for workers will be realized according to the master plan suggestions.

The public transportation in Rosh HaAyin is conducted through private companies and in 2016 the company managing the public transport is expected to change. According to a representative of "Afikim" company, the plan is to have 250 buses operational by the end of 2016. More importantly, the routes and operation hours will be enhanced, with an estimated increase of the population using the buses of up to 50%. A significant part of this upgrade consists of connecting the city to the train station in the peak hours in short and fast lanes, lines to the industrial (occupation) zone, new lines within the city, increase frequency of lines going from Rosh HaAyin to Tel-Aviv and a new line from Rosh HaAyin to the industrial (occupation) zone in Petah Tikva (the adjacent city). Lines will be added to Jerusalem and to additional cities to the north of Rosh HaAyin.

Some details regarding this activity are presented in the table below.

Table 69 - Action 6.7 in numbers

Action 6.7: Improve public transportation	
Duration	2016-2020
Total Implementation Cost (NIS)	50,000 NIS
Expected Private Funds Mobilized (NIS)	Not available
Annual Energy Savings (MWh)	4,729.54 MWh
Annual Emission Reduction (tn CO_2)	1,177.66 tn CO_2
Funding Source	Own funding
Net Present Value (NPV)	> 0

3.7.8 Cycling promotion and creation of related infrastructure

Although cycling is gradually gaining ground in the bigger cities in Israel, people in Rosh HaAyin are not accustomed with it.

This particular activity focuses on three distinct levels for the promotion of cycling in the region:

- Extensive dissemination activities, through information campaigns on the benefits of cycling. These campaigns may include the use of dissemination material, such as flyers, brochures etc., posters or advertisements on the local media (TV, radio). These campaigns will be gradually enriched with information on the infrastructural improvements that the municipality will realize.
- Creation of the necessary cycling infrastructure (bicycle lanes) across the road network of Rosh HaAyin. This network will be connected with the cycling route leading to Tel Aviv, planned at the governmental level to be realised in the coming years, as well as the train station, in order to ensure connection with major public transport hubs.
- Establishment of a municipal bicycling sharing program. Within this program's framework, a number of bicycles will be available to the citizens at a low rental price, backstopped by a number of stations throughout the city, where the citizen may get on and off.

This initiative is quite ambitious, expands to the 2030 horizon and requires external financing for its implementation.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 70, while an indication of the estimated emission reductions by 2020 is also provided. The action is a significant infrastructure investment that contributes to the improvement of quality of life, even though it is not considered economically viable. Additional indirect benefits should be considered for the project's profitability (the so called externalities) such as attraction of residents and tourists to the municipality, improvement of quality of life, environment and social conditions etc. Therefore, it is considered necessary for the city, even though it brings no economic profit directly to the municipal authorities. This action is a key priority for the municipality and it is further developed as project fiche.

Table 70 - Action 6.8 in numbers

Action 6.8: Cycling promotion and creation of related infrastructure	
Duration	2014-2030
Total Implementation Cost (NIS)	60,850,000 NIS
Annual Energy Savings (MWh)	5,675.45 MWh
Annual Emission Reduction (tn CO_2)	1,413.19 tn CO_2
Annual Emission Reduction (tn CO_2) by 2020	180.00 tn CO_2
Funding Source	EU+Gov. (Ministries of Transportation, Energy, Environment)
Net Present Value (NPV)	< 0

3.7.9 Promotion of walking - Car sharing and car pooling campaigns

Walking is one the basic ways for citizens' mobility within a community, and especially a relatively small one like Rosh HaAyin. This action is focused on a series of activities that will promote walking across the municipality. Such activities include:

- Installation of walking signs throughout the city, informing the citizen on the distance and time required to reach the municipality's key sites. These signs could also include info on the calories required to cross such a distance.
- Improvement of the pavements, making them friendlier for walking. This can be achieved with better maintenance for the replacement of damaged or broken flagstone tiles, enlargement of the pavement where considered feasible, planting of trees and flowers.
- Creation of pedestrian roads, especially in the commercial zone, or close to low circulation roads.
- Renovation of parks or other public areas (squares etc.), making them more attractive to the citizen.

- Large scale awareness campaign on walking, the benefits for the health, as well as the possibilities provided in the municipality.

Another scale of this action is the promotion of car sharing and car pooling, for those citizens that choose to use this mean of transportation. The municipality's role in this is mainly that of the coordinator. The municipal website can be utilised in order not only to familiarize people with the concepts of car sharing and car pooling, but also to bring them together and be the connecting point among them. Thus, the citizens (website users) will be able to inform on their routes and the timing of their transportation, in order to be matched with other citizens with the same transport habits. The elaboration of a relevant mobile application could be also explored, instead of using the municipality's website.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 71. The action is a significant infrastructure investment that contributes to the improvement of quality of life, even though it is not considered economically viable. Additional indirect benefits should be considered for the project's profitability (the so called externalities) such as attraction of residents and tourists to the municipality, improvement of quality of life, environment and social conditions etc. Therefore, it is considered necessary for the city, even though it brings no economic profit directly to the municipal authorities from energy savings.

Table 71 - Action 6.9 in numbers

Action 6.9: Promotion of walking - Car sharing and car pooling campaigns	
Duration	2016-2020
Total Implementation Cost (NIS)	2,000,000 NIS
Annual Energy Savings (MWh)	3,310.68 MWh
Annual Emission Reduction (tn CO_2)	824.36 tn CO_2
Funding Source	EU + Gov. (Min. of Transportation, Energy, Environment)
Net Present Value (NPV)	< 0

3.7.10 Adoption of real time information in public transport

Real-time information for public transport provides timely and accurate data such as route number, final destination, waiting time, service disruptions, etc. Commuters can make decisions about modes of travel and travel routes based on the provided information. In Europe, as well as some other parts of Israel, cities are implementing real-time information systems and analysis show that these measures result in an increase of up to 6% of the public transportation passengers.

According to the plan of the new company to undertake the public transport in the municipality, in the bus stops there will be electronic signs updating the passengers on the arrival times of the next bus.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 72 below.

Table 72 - Action 6.10 in numbers

Action 6.10: Adoption of real time information in public transport	
Duration	2016-2025
Total Implementation Cost (NIS)	450,000 NIS
Annual Energy Savings (MWh)	2,837.73 MWh
Annual Emission Reduction (tn CO_2)	706.59 tn CO_2
Annual Emission Reduction (tn CO_2) by 2020	400.00 tn CO_2
Funding Source	Own + Gov. (Ministry of Transportation) + Private Funds
Net Present Value (NPV)	> 0

3.7.11 Eco-driving promotion for professionals in private transportation

The municipality of Rosh HaAyin intends to realise a series of seminars targeted at the private transport professionals in Rosh HaAyin. The seminars will be initially addressed at the taxi and public buses' drivers, with the aim to be expanded to the truck drivers as well.

These seminars will be subsidized by the municipality, which will be in close collaboration with all private transport sector companies activated in Rosh HaAyin, in order to ensure that all their professionals will undergo this training, even a repeatable session if considered required, within the 2020 horizon.

The funding for this activity is expected to be ensured through sponsorships or funding programs by the related ministries.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 73. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 73 - Action 6.11 in numbers

Action 6.11: Eco-driving promotion for professionals in private transportation	
Duration	2016-2020
Total Implementation Cost (NIS)	1,500,000 NIS
Annual Energy Savings (MWh)	5,419.43 MWh
Annual Emission Reduction (tn CO_2)	1,410.35 tn CO_2
Funding Source	EU +Gov. (Ministries of Transportation, Energy, Environment)
Net Present Value (NPV)	> 0

3.7.12 Promotion of new technology buses in the public transportation

Public buses in Israel are quite energy consuming according to the CBS. Private transport companies are gradually proceeding to the partial renewal of their fleet with newer buses. The municipality of Rosh HaAyin will be in close collaboration with the public transportation company's representatives, in order to promote as much as possible new technology vehicles that are highly efficient.

As mentioned above, since 2016, a new company is undertaking the public transportation. The company's fleet of busses is very advanced technologically, with personal systems for each passenger – USB, Wi-Fi, advanced technology for accident prevention, spacious seats, accessibility, voice systems calling the next stations inside and outside the busses and more. Furthermore, the company is planning a "one stop shop" for tickets.

This action has no cost for the municipality and is expected to contribute significantly in its carbon footprint's reduction.

Related calculations on the expected energy savings and emission reductions are presented in Table 74 below.

Table 74 - Action 6.12 in numbers

Action 6.12: Promotion of new technology buses in the public transportation	
Duration	2016-2020
Total Implementation Cost (NIS)	-
Expected Private Funds Mobilised (NIS)	8,500,000 NIS
Annual Energy Savings (MWh)	3,427.02 MWh
Annual Emission Reduction (tn CO_2)	915.02 tn CO_2

3.7.13 Traffic congestion reduction through adoption of different timing of activities

Traffic congestion within the city in rush hour is one of the major reasons behind the cars' increased fuel consumption. In an effort to reduce as much as possible the traffic congestion, the municipality is considering in modifying the timing of different activities, with priority to activities under the direct control of the municipality, such as operation hours of municipal buildings, schools etc. A study within the framework of the transport master plan should be conducted in order to suggest specific activities that will be realised by 2020. It is estimated that reduced traffic congestion on rush hours can lead to at least 3% fuel savings.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 75.

Table 75 - Action 6.13 in numbers

Action 6.13: Traffic congestion reduction through adoption of different timing of activities	
Duration	2016-2020
Total Implementation Cost (NIS)	150,000 NIS
Annual Energy Savings (MWh)	6,124.69 MWh
Annual Emission Reduction (tn CO_2)	1,782.62 tn CO_2
Funding Source	Own funding + Gov. (Min. of Energy, Transportation, Education)
Net Present Value (NPV)	> 0

3.8 Agriculture

There are no agricultural activities in the municipality of Rosh HaAyin. It should be clarified that the provided consumptions by the IEC correspond most probably to a few residential houses, historically registered as farms, since their use has been altered within the years.

Only one activity is planned for this sector as presented in the table below.

Table 76 - Proposed actions for Agriculture

Action No	Action	Emission Reductions (tn CO_2)
7.1	Awareness raising activities	16.50

3.8.1 Awareness raising activities

The municipality plans to organise specific awareness raising actions, including seminars and lectures which will be accompanied by relevant printed material, in order to promote new technologies for urban farming. At the same time, it will be clarified through IEC to which consumers these consumptions correspond to, in order to modify appropriately the awareness raising activities. Related calculations on the action in terms of initial cost and emission savings are presented in Table 77.

Table 77 - Action 7.1 in numbers

Action 7.1: Awareness raising activities	
Duration	2016-2017
Total Implementation Cost (NIS)	40,000 NIS
Annual Energy Savings (MWh)	27.51 MWh
Annual Emission Reduction (tn CO_2)	16.50 tn CO_2
Funding Source	Own funding
Net Present Value (NPV)	> 0

3.9 Monitoring

Monitoring of the municipality's progress against the set targets is very significant, especially since it has to be realised in a frequent basis.

The following table includes the suggested indicators to monitor each action's progress against the initial objectives, in order any deviations from the target to be noticed quickly, and appropriate correction measures to be taken.

These indicators will be also utilised during the production of the actions' monitoring report to the Covenant of Mayors Office, in order to demonstrate the achieved progress and results.

Table 78 - Key performance indicators for the SEAP actions

Action No	Action	Key Performance Indicators	Measurement units
Municipal buildings, Equipment / Facilities			
1.1	Green procurement procedures for municipal buildings	• Number of devices that were bought with green procurement procedures	• Device number
1.2	Upgrading the municipal buildings' A/C and lighting systems	• Number of lamps that were replaced with LED lamps • Area covered with automations in lighting • Number of A/Cs that were replaced with new ones	• Number of lamps replaced each year • m^2 • Number of A/Cs
1.3	Energy Manager appointment in the Municipality	• Number of years that the Energy Manager is appointed and active • Number and % of municipal infrastructure under his supervision	• Number of years • Number and % of municipal infrastructure being supervised
1.4	Energy refurbishment of selected municipal buildings as pilot projects	• Average consumption and savings per m^2 in the refurbished buildings • Percentage of buildings that were refurbished out of the total number of buildings	• kWh/m^2 • %
1.5	Use of cool colours in municipal buildings' roofs	• Area covered with cool colours • Average temperature in the buildings	• m^2 • ^oC
1.6	Awareness raising activities for municipal employees	• Number of training seminars that were implemented • Municipal employees that were trained	• Number of seminars • Number of employees
1.7	The 10% commitment campaign for schools	• Total energy consumption in schools • Average consumption per m^2 in each school • Savings achieved per participating school in kWh and %	• kWh • kWh/m^2 • kWh and %
1.8	Awareness raising campaigns for pupils/ students	• Number of campaigns that were implemented • Students that were reached from the campaigns	• Number of campaigns • Number of students
1.9	Promotion of recycling	• Total amount of recycled waste in the Municipality • Total actions that were implemented to	• tn/year • Number of seminars, leaflets and other

Action No	Action	Key Performance Indicators	Measurement units
		• promote recycling • Available infrastructure in terms of recycle bins coverage	• actions • Number of recycle bins per square km area
1.10	Awareness raising campaigns to reduce the amounts of discarded food (reduction of the organic content of waste)	• Total amount of discarded food • Total actions implemented to raise awareness	• tn/year • Number of workshops, seminars, leaflets etc.
1.11	Installation of 700kW PVs in municipal buildings' rooftops	• Installed capacity of PV on roofs • Percentage of installed capacity compared to the initial target	• kWp • % out of 700kWp
Municipal public lighting			
2.1	Municipal lighting study	• Lighting study implementation	• YES/NO answer
2.2	Municipal lighting system upgrade	• Lamps that were replaced with energy efficient • MWh produced from PVs installed on lighting poles • % of lighting grid covered by automations	• Number of lamps • MWh • %
Residential buildings			
3.1	The 10% voluntary commitment campaign	• Total energy consumption in houses • Average consumption per m^2 in residential sector	• kWh • kWh/m^2
3.2	Promotion of Green Buildings' concept	• Number of buildings that were refurbished to become 'Green' • Number of promotion actions and average attendance	• Number of buildings • Number of seminars, leaflets etc. • People attended each action
3.3	Campaign for old A/Cs and lamps	• Number of lamps that were replaced with LED lamps • Number of A/Cs that were replaced with new ones	• Number of lamps replaced each year • Number of A/Cs
3.4	Information & awareness raising activities	• Number of awareness raising seminars and information days • Attendants in each event	• Number of activities • People attended each event
3.5	Initiatives supporting citizens' actions	• Number of actions implemented • Attendants in each event	• Number of actions • People attended each

Action No	Action	Key Performance Indicators	Measurement units
			action
3.6	Establishment of the municipal team	• Number of people that were consulted by the municipal team	• Number of people
3.7	3 MW Photovoltaics in residential rooftops	• Installed capacity of PV on roofs • Percentage of installed capacity compared to the initial target	• kWp • % out of 3 MWp
Commercial Buildings, Equipment / Facilities			
4.1	Seminars to professional groups	• Number of awareness raising seminars • Attendants in each event	• Number of activities • People attended each activity
4.2	10% voluntary commitment campaign	• Total energy consumption • Average consumption per m^2 in commercial sector	• kWh • kWh/m^2
4.3	Promotion of green buildings' concept	• Number of buildings that were refurbished to become 'Green' • Number of promotion actions and average attendance	• Number of buildings • Number of seminars, leaflets etc. • People attended each action
4.4	Other information and awareness raising activities	• Number of leaflets, brochures etc. distributed • People reached	• Number of leaflets, brochures etc. • Number of people reached
4.5	6 MW photovoltaic panels on building rooftops	• Installed capacity of PV on roofs • Percentage of installed capacity compared to the initial target	• kWp • % out of 6 MWp
Industrial Sector			
5.1	Subsidized energy audits at a volunteer basis	• Audits implemented at Industrial Facilities • Measures taken by the industries that were audited	• Number of audits • Number of Measures
5.2	Targeted training seminars	• Number of training seminars • Attendants in each event	• Number of seminars • People attended each seminar
5.3	10% voluntary commitment campaign	• Total energy consumption	• kWh

Action No	Action	Key Performance Indicators	Measurement units
		• Average consumption per m^2 in industrial sector	• kWh/m^2
5.4	Switch to “cleaner” electricity provider	• Number of industrial consumers that switched to new “cleaner” electricity providers • kWh / year that are produced by “cleaner” providers	• Number of customers • kWh / year
Transport			
6.1	Replacement of the municipal vehicles with new and more efficient	• Number of vehicles replaced • Fuel saved at an annual basis	• Number of vehicles • lt of Gasoline and Diesel
6.2	Efficient management of the municipal fleet	• Total distance covered by municipal vehicles per year • % of distance reduction at an annual basis	• km • % of total km reduced
6.3	Maintenance of the municipal fleet	• Number of cars maintained • Fuel saved at an annual basis	• Number of cars • lt of Gasoline and Diesel
6.4	Eco-driving seminars for the municipal fleet’s drivers	• Number of seminars implemented • Percentage of drivers that attended the seminars	• Number of seminars • % out of total number of drivers
6.5	Awareness raising on new vehicle technologies	• Number of awareness raising seminars • Attendants in each event • New vehicle purchases per year	• Number of activities • People attended each activity • Number of vehicles
6.6	Transportation master plan	• Implementation of the transportation plan • Percentage of the city area covered by the public transport	• YES/NO • % in total area
6.7	Increase the frequency of public transport routes	• Number of routes that included more buses • Number of routes that were changed	• Number of routes • Number of routes
6.8	Cycling promotion and creation of related infrastructure	• Total area of cycling roads constructed • Total bicycle parking areas constructed	• m^2 • Number of bicycle parking areas
6.9	Promotion of walking, car sharing and car pooling campaigns	• Area of pavements constructed/refurbished • Number of walking signs installed • Number of parks etc. renovated • Number of awareness raising activities	• m^2 • Number of signs • Number of public areas • Number of activities

Action No	Action	Key Performance Indicators	Measurement units
6.10	Adoption of real time information in public transport	• Number of e-signs installed • Number of passengers in each route	• Number of signs • Number of people
6.11	Eco-driving promotion for professionals in private transportation	• Number of seminars implemented • Percentage of drivers that attended the seminars	• Number of seminars • % out of total number of drivers
6.12	Promotion of new technology buses in the public transportation	• Number of buses replaced with new	• Number of buses
6.13	Traffic congestion reduction through adoption of different timing of activities	• Number of Municipal services that changed operation schedules • Average % of traffic congestion hours per day	• Number of services • % of day
Agriculture			
7.1	Awareness raising activities	• Number of awareness raising seminars • Attendants in each event	• Number of activities • People attended each activity

References

- Central Bureau of Statistics (CBS), Vehicles section http://www1.cbs.gov.il/reader/cw_usr_view_SHTML?ID=616. Tables used:
  - "Average kilometres travelled per vehicle, by type of vehicle and by age, type of fuel, and gross weight", http://www1.cbs.gov.il/shnaton65/st24_14.pdf
  - "Motor vehicles by type and country of production", http://www1.cbs.gov.il/www/publications14/1570/pdf/t04.pdf
- CBS, Transport Statistics Quarterly No. 4, 2014, Land Transport, "Table 14: Buses, Seats, Gasoline Consumption, Kilometres Travelled and Revenue from trips of bus services in scheduled routes".
- Presman N, Arnon A. (2006), Commuting Patterns in Israel 1991-2004, Bank of Israel.
- Israeli Electricity Company, Commitment to Reduce Environmental Effects (מחוייבות לצמצום השפעות סביבתיות).
- IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, Chapter 5 on Waste.
- Saheb Y., Kona A., Maschio I., Szabo S. (2014), "Guidebook: How to Develop a Sustainable Energy Action Plan (SEAP) in South Mediterranean Cities", JRC.
- Covenant of Mayors (2010), "How to Develop a Sustainable Energy Action Plan (SEAP) – Guidebook Part 2".
- Ayalon O., Avnimelech Y., Shechte M. (2000), Alternative MSW treatment options to reduce global greenhouse gases emissions – the Israeli example, Waste Management and Research, Volume 18 (6), pp:5 38–544.
- Technion Israel Institute of Technology, Faculty of Mechanical Engineering, Center for research in energy engineering and environmental conservation, Internal Combustion Engines Laboratory, http://www.sviva.gov.il/subjectsEnv/EnvInfo/AlternativeFuels/Documents/7AlternativeFuel.pptx
- Israel meteorological service, CBS, Statistical Abstract of Israel 2013, Table 1.6: Global Radiation and Duration of Sunshine by Station.
- Web sources with data on Israel for the calculation of solar water heaters
  - http://www.sustainablebusiness.com/index.cfm/go/news.display/id/23251
  - http://www.treehugger.com/renewable-energy/harnessing-suns-energy-water-and-space-heating.html
- Cerutti A.K., Janssens-Maenhout G., Iancu A., Gabrielaitiene I., Melica G., Zancanella P. and Bertoldi P. (2013). How to develop a sustainable energy action plan (SEAP) in the Southern Mediterranean Partner Countries, The Baseline Emission Inventory. JRC.

ANNEXES

ANNEX A – Consumption of Educational Buildings

Site Name	No	Annual Energy Consumption (kWh)
High Schools	1	506,347
	2	267,310
Middle Schools	1	141,004
	2	150,180
	TOTAL	**291,184**
Elementary schools	1	118,117
	2	92,148
	3	94,076
	4	114,096
	5	109,524
	6	111,972
	7	128,158
	8	97,348
	9	68,472
	10	97,230
	11	157,142
	12	136,153
	13	90,081
	TOTAL	**1,414,517**
Preschools	1	14,505
	2	7,833
	3	6,865
	4	13,251
	5	12,464
	6	7,542
	7	5,378
	8	4,257
	9	40,170
	10	15,899
	11	8,166
	12	19,166
	13	11,847
	14	12,832
	15	18,621
	16	11,298
	17	9,988
	18	19,793
	19	16,111
	20	6,175
	21	8,782
	22	10,041
	23	13,940
	24	6,861
	25	13,117
	26	3,894
	27	7,117
	28	21,872
	29	6,141
	30	11,425
	31	7,462
	32	8,284
	33	12,811
	TOTAL	**393,908**
All Schools	**TOTAL**	**2,873,266**

ANNEX B – Public Transport Data

Bus Line Number	Route Distance Travelled Within LA (km)	Days / Week	Routes / Day	Annual Distance Travelled Within LA (km)
1	8	6	116	279,096
2	8	6	116	279,096
3	8.2	5	30	61,710
7	8.2	6	150	370,260
17	14.1	6	150	646,380
27	12.7	6	150	580,860
472	10.8	6	96	314,842
250	11.2	5	24	68,088
282	11	5	12	33,420
300	11	5	26	72,410
TOTAL	103.20			2,706,162

ANNEX C – Project Fiches

Awareness raising campaigns to reduce the amounts of discarded food (reduction of the organic content of waste)- #1

1. General Presentation

Location	Start date	Project Lifetime
RHA municipality area	2016	5 years

Project Owner / Lead Actor

Municipality of Rosh Ha Ayin

Contact person

Mr. Shlomo Gispan – head of Sh.F.A. wing (city appearance)

Summary of the Action

Waste contribution in the RHA municipal emissions is a little lower than 4%, so it is not considered the most emitting sector in the territory. Moreover, the municipality is realising a lot of efforts in recycling, currently accounting approximately 32%, comprising of 11% recycling plastic and cardboard, glass etc. and 21% recycling yard waste. However, the municipality recognizes the fact that throwing food to waste is a very common phenomenon in the area, especially as concerns fruit, vegetables etc. that are widely available and produced in the region.

Therefore, the municipality chose this action as priority, since not only it is a waste related activity that will reduce the strain on the municipal resources for waste collection, but at the same time will also reduce significantly the respective methane emissions, as well as preserve one of the most basic resources, food, and indirectly water.

Currently 13,000tn of waste from RHA are being land filled annually. Although the waste composition is not available, according to the Israeli national average, organic waste comprises 40% of the waste. It is considered by the municipal team that in RHA this amount is higher, but for the calculations, this baseline will be used. This 40% corresponds to 5,200 tn of organic waste, while currently only 150 tn are being recycled annually.

Although no energy savings will be achieved through this action, the target for the reduction of the organic waste amounts is set at approximately 5%, namely 260 tn.

The calculation of the emissions from waste, if these amounts are not discarded, are according to the following formula of the IPCC default method:

Methane emissions (Gg/yr) = (MSW_T • MSW_F • MCF • DOC • DOC_F • F • 16/12-R) • (1-OX)

Where:

- MSWT total MSW generated (Gg/yr)
- MSWF fraction of MSW disposed to solid waste disposal sites
- MCF methane correction factor (fraction)
- DOC degradable organic carbon (fraction) (kg C/ kg SW)
- DOCF fraction DOC dissimilated
- F fraction of CH4 in landfill gas (IPCC default is 0.5)

- 16/12 conversion of C to CH4
- R recovered CH4 (Gg/yr)
- OX oxidation factor (fraction – IPCC default is 0)

The IPCC default method assumes that all the potential of CH_4 emissions is released during the same year the waste is disposed of. The method introduces various specific default values and recommendations, for use in countries with lack of statistical data for Solid Waste.

The calculation of the degradable correction factor (DOC) is based on the following equation.

DOC=0.4*A+0.17*B+0.15*C+0.3*D

Where:

- A Percentage of paper and textiles in SW
- B Percentage of garden and park waste and other organic putrescible in SW
- C Percentage of Food waste in SW
- D Percentage of wood and straw waste in SW

If the above calculations are conducted, the new emissions will be 332.4 tn CH_4, or 8,311 tn CO_2, resulting in a decrease of emissions by 698 tn, against the 9,009 tn CO_2 of the BEI.

Rosh HaAyin is planning to launch an awareness raising campaign on reducing the organic content of waste, especially targeting the amounts of food being discarded, contributing at the same time on the preservation of resources. The awareness campaign will include the dissemination of messages through radio, newspapers and television, especially using local media, production of promotional material (leaflets, brochures, posters) and perhaps billboard advertisements. Special events for school children will be realized as well.

General Objectives of the Project	Principal partners and stakeholders
1. *Promote food preservation among the residents in order to achieve a 5% reduction of food waste amounts.* 2. *Expand the awareness activities in the new part of the city as well, addressing all RHA residents.*	1. *Ministry of Environmental protection* 2. *Environmental citizens groups*
Ultimate beneficiaries of the project	**Link to municipal development plans / urban plans / other municipal or city programs**
1. Municipality of RHA 2. RHA citizens	1. This action has been proposed as part of the municipality's SEAP in the actions on waste management to be undertaken by the municipality.
Estimated investment cost needed	
EUR: 47,600	
NIS: 200,000	

2. Technical Description

Area(s) of intervention (sectors as specified in the SEAP proposed by CoM)	Main adopted Technology & Equipment
Waste management	N/A since it is an awareness raising activity

Site / Place	Status of the action			
The project focuses on all residents in RHA	**New**	Planned	Under implementation	Following previous action

Start date	Project Lifetime	Previous or linked studies
Mid 2016	5 years	No previous studies on waste composition are available at municipal level.

Engineering Studies	Not applicable for the specific action
Implementation plan / Construction plan	The implementation of the action is expected to be initiated within 2016 and run for 5 years, till 2020. No construction plan is envisaged for this type of action.
Other previous	Not applicable for the specific action
Environmental impact assessment	Not applicable for the specific action

3. Organization and procedures

Formal approval	Legal responsible body
The city council needs to approve the SEAP plan. This is planned for the beginning of 2016 and will be subject to funding from the Ministry of Environmental Protection.	The municipality is the legally responsible body to launch the awareness raising campaign
Staff allocated to prepare, implement and monitor the action	**Municipal / City Staff Training Needs**
1 half time employee can lead the project on all its facets. All educational and awareness rising activities should be led by the same employee, who can be assisted by different lecturers to promote the awareness and build capacity throughout the city.	Training needs for the municipal staff are not considered necessary for the action's preparation and monitoring.
Technical Assistance Needs	**Role of Partners**
No technical assistance is required, due to the nature of the action	• The Ministry of Environmental Protection has set a goal to reduce landfilled waste and promote recycling. The specific Ministry can contribute not only in terms of financing, but also with the know- how it already holds in the process, as well as material on awareness raising activities. • The SEAP team will be in close collaboration with the educational department, providing all technical expertise considered necessary. • Environmental awareness groups will be invited for discussion during the action's implementation, in order to support and disseminate it as much as possible among the community's residents.

4. Cost Estimates

Initial and start-up expenses	EUR: 19,000 NIS: 80,000	**Net Present Value (NPV)**	**Assumptions**
Operational Costs (approx.)	EUR: 7,000 NIS: 30,000	EUR: 73,110	The savings considered derive from the reduction of the collection and landfilling costs of waste, around 550 NIS per tn of waste. Around 30,000NIS annually are for awareness raising campaigns and activities, while the initial cost of 80,000 is considered for the design of the campaign. The operational costs are covered from the gross annual created income. NPV is calculated in a period of 4 years, while it is considered 5%. If the target is achieved, the investment pays off in less than two years.
Annual Income (approx.)	EUR: 34,000 NIS: 143,000	NIS: 307,000	

5. Funding Sources

Funding Source	Fund
Local Authority's own resources	The local authority can dedicate the necessary resources to manage the project and pay for the annual campaign from the savings in the waste collection. It cannot pay for the initial design of the awareness raising campaign.
National Funds and Programs	The Ministry for Environmental protection could potentially finance the action, or at least a part of it.
International Financial Institutions	
EU Funds & Programs and other external funds	
Public-Private Partnerships	
Lined up Private Investments	
Loans and Potential Borrower	
Expected Annual Cost Savings to City Budget	The expected costs savings in the city's budget can finance the project's operation.
Other	

6. Projected Energy Estimates in 2020

Energy Savings (MWh/a)	Renewable Energy Production (MWh/a)
No energy savings are foreseen from the action	No renewable energy production is foreseen by the action

CO_2 Reduction (tn CO_2/a)	
Target Year	2020
Net reduction on the Territory	698

Reduction as related to BAU Scenario	1%
Per Capita calculated reduction	8.7 kg CO_2

7. Summary of Related Awareness Raising (AR) Actions

Awareness Raising related to the Action

A major challenge for the project is the citizens' participation in the initiative. In order to persuade the citizens to save food and not discard it, broad dissemination activities will be organised, such as info days for the citizens, dissemination of messages through radio, newspapers and television, especially using local media, production of promotional material (leaflets, brochures, posters) and perhaps billboard advertisements. Special events for school children will be realized as well.

Awareness raising related to the Community

The achieved results in terms of reduced amounts of waste are monetary and carbon dioxide savings for the community and these will be shortly reported by the municipal team at an annual basis, as a follow up action of the project's monitoring.

8. Assumptions and risks

The risk of the citizens' reduced interest and participation in the initiative, as well as the inability to persuade them on the goal, are the major risks for not achieving the set target.

The assumption made refers to the % of organic contribution to the total waste, since no waste composition analysis for RHA exists. However, according to the municipal staff, it is expected that organic contribution is higher in the territory compared to the national average.

9. Key Success Factors

A successful awareness campaign addressing all the citizens and age groups, from young to old, to which they can relate and actively participate.

10. Next Steps

Plan the awareness campaign and the municipal team to deal with the project. Attract financing for the initial step.

11. Annexes / References to Annexes

Not available

Municipal Lighting System Upgrade - #2

1. General Presentation

Location	Start date	Project Lifetime
RHA municipality area	2016	5 years

Project Owner / Lead Actor

Municipality of Rosh Ha Ayin

Contact person

Mr. Shlomo Gispan, head of Sh.F.A wing (city appearance)

Mr. Arie Gelberg, head of Engineering wing (Head Engineer)

Summary of the Action

Municipal lighting is one of the key contributors in the municipal consumptions and thus an area where efficiency measures can be broadly implemented.

According to the municipality's available data, the municipal lighting system currently constitutes of Mercury lamps, with only few LEDs. The numbers of lamps and installed capacity per type is described in the table below.

Type of lamp	Number	Watt
Mercury lamps	1,254	70
Mercury lamps	649	100
Mercury lamps	450	125
Mercury lamps	2,696	150
Mercury lamps	1,721	250
Mercury lamps	83	400
Mercury lamps	86	1,000
LED	164	120
Total	**7,103**	**-**

The action on the municipal lighting system's upgrade focuses on four axes and is based on a lighting study that should be conducted first, and has also been included in the municipality's SEAP:

- 1st axis: Better maintenance of the system. This activity focuses on the proper maintenance of the system, so that damaged light bulbs are replaced as soon as possible with new and more efficient ones.

This activity is already being realised by the municipality and the plan is to intensify it as much as possible.

- 2nd axis: Update of the lighting system infrastructure. The lighting systems in the municipality are considered very old and dysfunctional, facing wiring problems, outdated infrastructure etc. This axis is targeted at the gradual renewal of the whole infrastructure, where considered necessary. The municipal team is already aware of the problematic parts of the infrastructure; however, their verification through the lighting study is desired.
- 3rd axis: Introduction of LED technology and gradual replacement of old light bulbs. This action relates to the gradual replacement of the current operating lamps, which are Mercury lamps of a variety of power, as soon as their lifetime is reached, with LED lamps, which are more efficient and have longer lifetime, improving at the same time the required brightness levels. Replacement of the existing lamps will be conducted only in the old part of the town. In the new part, the municipality has already decided that all lamps to be installed will be LEDs.
- ***4th axis: Modification of the lighting grid's density. This action will lead to the more rational placement density of the lighting poles, especially in areas that are less densely populated, with the removal of redundant poles and the increase in their placement distance in the expansion areas of the lighting grid. Moreover, the introduction of LED technology can further result in the reduction of the light bulbs per pole, in order to have the same end result.***

The current action fiche focuses on the 3rd axis. At the same time, the 1st axis is planned to be implemented by the municipal staff at a more frequent basis. No added costs are envisaged for the specific activity, since the maintenance will be covered by the existing municipal staff. Under the 2nd axis, the difficulties faced by the municipality in terms of infrastructure are being elaborated. For its renewal, a broad investment should be realised. However, the specificities for the actions under this axis should come as a result of the lighting study to be conducted. The same is valid for the 4th axis as well.

The 3rd axis constitutes the replacement of the mercury lamps with LEDs, according to the following power and cost.

Number of lamps	Mercury lamp power (W)	LED power (W)	Cost	Total Cost (€)	Energy Savings (MWh)	Cost Savings (€)
1,254	70	30	150€	188,100 €	200.64	22,595.89
649	100	40	200€	129,800€	155.76	17,541.54
450	125	60	230€	103,500 €	117.00	13,176.43
2,696	150	70	320€	862,720 €	862.72	97,158.7
1,721	250	120	490€	843,290 €	894.92	100,785.0
83	400	180	700€	58,100 €	73.04	8,225.695
86	1,000	460	1,000€	86,000 €	185.76	20,920.11
6,939	**-**	**-**	**-**	**2,271,510**	**2,489.84**	**280,403.4**

The cost savings at an annual basis have been calculated using the price of 473 NIS / MWh and the

exchange rate of 1€ = 4.2 NIS

No additional cost for the dismantling and positioning of the new lamps is considered, since this cost will be realized by the municipality's technical team.

The envisaged energy savings are calculated at 2,490 MWh annually, or 1,177,694 NIS (280,403€) monetary savings from the municipal budget.

General Objectives of the Project	Principal partners and stakeholders
1. *Reduce energy consumptions in the municipality by at least 50%.* 2. *Reduce light pollution.* 3. *Increase road safety by improving lighting levels.*	1. *Ministry of National Infrastructure, Energy and Water resources* 2. *Israeli Electricity Company*
Ultimate beneficiaries of the project	**Link to municipal development plans / urban plans / other municipal or city programs**
1. Municipality of RHA 2. RHA citizens	This action has been proposed as part of the municipality's SEAP in the actions on street lighting to be undertaken by the municipality.

Estimated investment cost needed	
EUR:	2,271,500
NIS:	9,540,300

2. Technical Description

Area(s) of intervention (sectors as specified in the SEAP proposed by	Main adopted Technology & Equipment
Street lighting	The project focuses on the replacement of existing lamps with lamps of LED type. LED lamps are a widely adopted technology at the worldwide level, which is proven to lead to energy reductions even higher than 50%. No risks are associated with the adoption of the specific technology.

Site / Place	Status of the action			
RHA lighting system across town	**New**	Planned	Under implementation	Following previous action

Start date	Project Lifetime	Previous or linked studies
Mid 2016	5 years	No previous studies are available at municipal level. However, for the better upgrade of the municipal lighting, the foreseen action on the conduction of a municipal lighting study should be realised first, so that its outputs are adopted when upgrading the system.

Engineering Studies	A municipal lighting study to be realised by a specialised expert should be conducted. Based on this study's outputs, the planning of the whole upgrade will be adjusted and implemented.

Implementation plan / Construction plan	Following the implementation of the related engineering studies, the Procurement department of the municipality should publish a tender for the acquisition of the required equipment. The action is expected to be beneficial to the municipality against the related costs, since the achieved energy savings over their lifetime, as presented in the description of the action, are expected to bring the necessary payback period.
Other previous	No other studies are available
Environmental impact assessment	Although the environmental impact assessment of the action has not been studied, it is considered that the action's impact is only beneficial in terms of environmental pollution, not only LED lamps consume less energy, but at the same time their lifetime is four times more compared to the existing lamps, thus impacting less the environment when it is time for their retraction.

3. Organization and procedures

Formal approval	**Legal responsible body**
The city council needs to approve the SEAP plan. This is planned for the beginning of 2016 and will be subject to funding from the Ministry of National Infrastructure, Energy and Water Resources.	The municipality is the legally responsible body to conduct the necessary tenders for the action, in order to acquire the necessary equipment.
Staff allocated to prepare, implement and monitor the action	**Municipal / City Staff Training Needs**
The specific action will be coordinated by the existing staff of the responsible municipal department. The part time engagement of 1 person is considered satisfactory for the procurement and selection of the external contractor and the equipment, as well as monitoring purposes.	No specific training needs are envisaged for this action. However, the engagement of an experienced consultant for the conduction of the lighting study and in an advisory role to the municipality is considered essential.
Technical Assistance Needs	**Role of Partners**
Technical assistance for the implementation of the lighting study is considered necessary.	• The Ministry of National Infrastructure, Energy and Water Resources is to be actively engaged in the activity, bringing its experience as well as a part of the required funds. • Since a large part of the project focuses on the improvement of the existing infrastructure, the participation of the Israeli Electricity Company in the action's implementation, where necessary, is considered important, especially where wiring issues are encountered.

4. Cost Estimates			
Initial and start-up expenses	EUR: 2,271,500 NIS: 9,540,300	**Net Present Value (NPV)**	**Assumptions**
Operational Costs (approx.)	Already covered by the municipal budget	EUR: 519,626	The "income" is based on the considered energy and monetary savings achieved at an annual basis from the municipal budget. For the calculation of the NPV, it has been considered equal to 3%. It should be noted that the action's NPV is considered for the whole lifespan of LED lamps (approximately 50,000 hours or 12.0 years in this case). The payback period is around 9.5 years
Annual Income (approx.)	EUR: 280,400 (net) NIS: 1,177,694 (net)	NIS: 2,182,430	

5. Funding Sources	
Funding Source	**Fund**
Local Authority's own resources	The local authority can dedicate the necessary resources to manage the project. It cannot finance the action itself.
National Funds and Programs	The Ministry for National Infrastructure, Energy and Water resources could finance a part of the action.
International Financial Institutions	Israeli banks against the expected annual cost savings. More detailed studies on the action's feasibility will be necessary.
EU Funds & Programs and other external funds	SUDEP or SUDEP like initiatives
Public-Private Partnerships	
Lined up Private Investments	
Loans and Potential Borrower	
Expected Annual Cost Savings to City Budget	The expected costs savings in the city's budget can finance the project's operation, and potentially a loan for the required initial infrastructure under an ESCO or a bank.
Other	

6. Projected Energy Estimates in 2020	
Energy Savings (MWh/a)	**Renewable Energy Production (MWh/a)**
2,489	No renewable energy production is foreseen by the action

CO_2 Reduction (tn CO_2/a)	
Target Year	2020
Net reduction on the Territory	1,493.4
Reduction as related to BAU Scenario	2.02%
Per Capita calculated reduction	18.7 kg CO_2

7. Summary of Related Awareness Raising (AR) Actions

7. Summary of Related Awareness Raising (AR) Actions
Awareness Raising related to the Action
Since the action is being realised on solely municipal infrastructure, reaching out to the citizens doesn't have significant impact for its success. However, the specific action can serve as a demonstration project for the community, in order to showcase a new technology and that the municipality is taking actual action to decrease its consumptions, leading the way to its citizens in order to contribute through their behaviour in energy savings.
Awareness raising related to the Community
The awareness raising tools to be used for informing the citizens on the action undertaken by the municipality include press releases and articles in local newspapers and magazines, announcements in the social media and extensive project descriptions and reports on the results. Simple awareness activities on the action could be also suggested, such as the addition of a small sign in each pole, with an explanation on the action and its benefits, as well as the funding institutions (e.g. sponsored by the Ministry of Energy, or the Israeli Electricity Company etc.). Alternatively a QR code for smart phones with the required explanations could be added.
8. Assumptions and risks
No specific risks are associated with this action, since it is an activity based on a mature technology. Moreover, its success doesn't depend on the participation by the citizens. However, the risks concerning its financing, if this comes through Israeli banks or donors against the foreseen energy savings, is that the specific financing mechanism has been extensively tested in the country and thus the national actors are reluctant in adopting it.
9. Key Success Factors
For the specific action, there are no specific factors considered as key for its success.
10. Next Steps
Elaboration of the lighting study and identification of the axes 2 and 4 priorities. Efforts for the identification of more competitive prices for the quantity of the required lamps and procurement procedures by the municipal office.
11. Annexes / References to Annexes
Not available

Promotion of Green buildings' concept - # No 3

1. General Presentation

Location	Start date	Project Lifetime
Rosh Ha'ayin municipality area	2016	5 years

Project Owner / Lead Actor

Municipality of Rosh Ha'ayin

Contact person

Mr. Shlomo Gispan – head of SH.F.A (city appearance) Wing, Mr. Arie Gelberg, head of Engineering wing (Head Engineer)

Summary of the Action

The lack of mandatory application of the green building code of practice in Israel is one of the key issues behind the moderate energy behaviour of buildings in the country.

As a result, the green buildings' concept is not widely implemented and there are many misconceptions related to the code: it's too expensive, it has a very low ROI, only those who have extra cash flow can implement it – it's not worth raising the loans for it, it's very complicated, it's only important in cold countries. These misconceptions are widespread both with residents and potential apartment buyers, but unfortunately also within the professional community. Many of the building contractors believe that building "green" will raise the prices by 10-15%, and in a country where housing is considered to be already very expensive, every option to reduce the price is being praised.

The action needs to promote the green buildings' concept from several directions: it is vital to educate the general public and the potential buyers on the importance of green building, the advantages, and more importantly the breakdown of the elements. It is considered to be "either/or", either the building is green or not, without realizing that some of the elements can be implemented quite easily and at a very low costs. As the buyers will become more knowledgeable, the demand for inclusion of some of the elements in the new projects will rise. The next inevitable stage will be from the constructors' side (and relevant professionals) who will recognise the demand, and consequently begin offering the green elements to promote their sales.

Therefore, this action is targeted towards the promotion of specific elements of the green buildings' concept, that can be applied in existing or new buildings as well, with the target that the rates with which citizens adopt such types of measures will be increased. Special focus will be placed on promoting this concept among those citizens interested to move in the part of the new city being built, as well as the constructing companies engaged in this activity.

Customised sets of potential interventions and actions will be suggested to the citizens through info days and awareness activities in the local media (local newspapers, TV and radio), as well as distribution of dissemination material (flyers, brochures etc.). Short courses and workshops will be held for those interested in more extensive knowledge. These interventions will mainly target the existing buildings on the need to install shadings in the southern glazing and roof insulation, as well as paint the buildings' facade and roofs with cool colours, that reduce thermal absorption. For the new buildings, where required changes can be realised from the design phase, emphasis will be placed on the optimal

orientation of the building, the need for increased natural lighting and natural ventilation, the inclusion of a minimum level of insulation in the buildings' exterior surfaces (walls and roof), as well as shading in the glazing. In addition to the above the use of cool colours will also contribute significantly to the reduction of energy losses. All these suggested activities will be accompanied by a brief cost estimation and analysis, explaining their benefits to the citizens not only from the improvement of living conditions in the house point of view, but more importantly from their contribution in decreasing energy related costs and bills.

At the same time, meetings and workshops will be realised with the construction companies' representatives, home owners' association, local leaders (chairs of quarters committees) highlighting the importance for the Mayor and the municipality of green principles' adoption in the newly erected buildings.

Green buildings consume approximately 25% less energy compared to a compatible building. Although full adoption of the green building concept at a large scale is not considered for the time being, the municipality will focus on the promotion of at least certain key features of this approach, for both the existing buildings, as well as the new part of the town being constructed. The penetration of the green buildings' concept and the adoption of selected measures by the existing households is expected to result in a 5% overall energy savings. However, in order to achieve this, the municipality will work closely with the constructors, besides the more targeted to the citizens awareness raising activities.

General Objectives of the Project	Principal partners and stakeholders
1. *Educate citizens, potential buyers and professionals on the advantages of green building* 2. *Promote implementing elements of green building in planned new buildings as well as in existing homes.* 3. *Reduction of the carbon footprint from the residential sector*	1. *Engineering department and SEAP team of Rosh HaAyin Municipality* 2. *Ministry of National Infrastructure, Energy and Water* 3. *Ministry of building and housing* 4. *NGO for promotion of green building (ILGBC the Israeli Green Building Council and similar)*
Ultimate beneficiaries of the project	**Link to municipal development plans / urban plans / other municipal or city programs**
1. Rosh Ha'ayin residents – present and future	1. This action has been proposed as part of the municipality's SEAP in the residential sector. 2. The action is fully coordinated with the municipal Building Master Plan that has been commissioned by the Mayor

Estimated investment cost needed	
EUR:	59,500
NIS:	250,000

2. Technical Description

Area(s) of intervention (sectors as specified in the SEAP proposed by CoM)	Main adopted Technology & Equipment
Residential sector	The specific action focuses on educational and awareness raising program, and as such it doesn't envisage the adoption of any technology or equipment.

Site / Place	Status of the action			
The action focuses on homes throughout the city, but is expected to have a greater effect in the new neighborhoods	**New**	Planned	Under implementation	Following previous action

Start date	Project Lifetime	Previous or linked studies
Mid 2016	5 years	No previous studies have been realised on the action. However, the Environment Municipal Committee has researched the options on green buildings' implementations and has formally recommended that the city will adopt the code, or parts of it. Consequently, the city council has approved the recommendation, striving to enforce the one-star level on the new buildings (those still in the planning stage).

Engineering Studies	Not applicable for the specific action
Implementation plan / Construction plan	The city council has adopted the one-star Green Building Code to be implemented in the new buildings (those still in the planning stage). A more comprehensive plan needs to be developed with detailed requirements and enforcement mechanisms.
Other previous studies	Not applicable for the specific action
Environmental impact assessment	Has been realized in the framework of the new neighborhoods planning

3. Organization and procedures

Formal approval	Legal responsible body
The action has been a priority for the municipality and its formal approval is expected early 2016, along with the SEAP approval by the municipal council. The one star green building code has been approved; detailed requirements and enforcement mechanisms will be developed in the coming months.	The municipal council is the legal responsible body for approval of the action.
Staff allocated to prepare, implement and monitor the action	**Municipal / City Staff Training Needs**
The Engineering wing with the Sh.F.A. (city appearance) wing will be engaged in this activity for its implementation and overall coordination. The municipal staff will be responsible for all awareness raising activities including organizing information days, preparing visual aids (flyers, posters, newsletters, radio ads etc.). The activities will be diverse (lectures, workshops, seminars, information days) to different audiences. The municipal staff will also	Some training needs for the municipal staff is considered necessary for the action's preparation, implementation and monitoring. Marketing the project, approaching the diverse target audience is not simple and should be planned accordingly. Materials should be prepared based on existing awareness raising activities of green building that have been implemented in other places, however they need to be adapted for Rosh Ha'ayin. This type of activity does not need official training, but does need the consultant as a mentor. The first

coordinate the different stakeholders and include as many of them as possible such as NGOs – local and national, representatives from the ministries, experts, suppliers of green products relevant to green building. The engagement of 1 full time person from the municipality's personnel for the above mentioned action is envisaged with assistance from an Energy Expert as a mentor for the first two years.	two years will create the basis for the following years, with additional challenges foreseen, especially in recruiting new participants and keeping the already reached out participants active. In order to make a change, citizens need to be constantly reminded and further educated on the different aspects of green building. As the present municipal staff is very much overworked and cannot add 100% to their workload, additional staff is necessary.
Technical Assistance Needs	**Role of Partners**
No technical assistance is required, due to the nature of the action.	• The SEAP team will be in close collaboration with the Environment department, providing all technical expertise considered necessary for the outreaching, monitoring and implementation of the action. • Ministry of building and housing has some programs relevant to the action. Therefore, the ministry is expected to provide some educational material, assist with promotion, and also is expected to participate with a certain amount to cover the operational costs. • The Ministry of National Infrastructures, Energy and Water will provide some educational material and professional guidance, while it is also expected to participate with a certain amount to cover the operational costs • The Israeli Green Building council (or similar NGO) is expected to play an important role in the motivation and awareness rising in Rosh Ha'ayin. The NGO also has knowledge and experience from similar projects they could share with the local SEAP team.

4. Cost Estimates

Initial and start-up expenses	EUR: 11,900 NIS: 50,000	**Net Present Value (NPV)**	**Return of Investment (IRR)**
Operational Costs (approx.)	EUR: 11,900 NIS: 50,000	EUR: >>0	As a capacity building and awareness raising activity the calculated NPVs are extremely high. However, no income for the municipality is created by this action and should be considered as an investment by the municipality to its citizens.
Annual Income (approx.)	EUR: - NIS: No income is created	NIS: >>0	

5. Funding Sources	
Funding Source	**Fund**
Local Authority's own resources	Contribution up to 10% of the project's annual budget
National Funds and Programs	Ministry of National Infrastructure, Energy and Water resources up to 100,000 NIS Ministry of building and housing resources up to 100,000 NIS
International Financial Institutions	
EU Funds & Programs and other external funds	SUDEP or SUDEP like project
Public-Private Partnerships	
Lined up Private Investments	
Loans and Potential Borrower	
Expected Annual Cost Savings to City Budget	Not Applicable
Other	

6. Projected Energy Estimates in 2020	
Energy Savings (MWh/a)	**Renewable Energy Production (MWh/a)**
10,635	N/A
CO_2 Reduction (tn CO_2/a)	
Target Year	2020
Net reduction on the Territory	6,381.26
Reduction as related to BAU Scenario	8.6%
Per Capita calculated reduction	79.8 kg CO_2

7. Summary of Related Awareness Raising (AR) Actions
Awareness Raising related to the Action
Awareness raising activities will be realised broadly to disseminate the importance of Green Building. Lectures, special information days, production of brochures and posters to be sent by post to houses and be visible in all municipal buildings and schools. Radio short messages in the initiative may also be utilised as well as direct outreaching through organized groups such as pupils, home owners' association, local environmental activists etc. The activities will promote the green building concept and will also invite suppliers of relevant products and services to demonstrate their advantages and possibly offer reduced prices for Rosh Ha'ayin residents.

Awareness raising related to the Community
The results of the action at an annual basis will be widely communicated to the citizens to demonstrate the potential for pollution, energy and monetary savings that can be achieved, as well as the efforts being placed by the municipality to turn greener. For example, new buildings that will have the one-star code or existing buildings which will integrate elements of the code will have visual information in the buildings' lobby, and listed in the local newspaper, and municipal website.
8. Assumptions and risks
The main assumption and at the same time risk for the action is the interest of local citizens to participate in the awareness raising activities and to invest in green building elements in their present or future homes. As housing is very expensive, any additional cost is considered a risk, thus usually ignored. The financial benefits from the operational savings, as well as the better living conditions (e.g. less air conditioning required etc.) should be significantly stressed, so that the citizens are persuaded this investment is worth the money. It is also necessary to keep the campaign going so as to engage more and more participants, this is not always simple especially as the municipality's resources are very low, and cannot finance this action without external financial contribution from sources external to the municipality.
9. Key Success Factors
Appointing the appropriate person to lead this action is very important. This person will have the assistance and backing of the SEAP team, as well as the energy expert as a mentor. In addition, the action has the full support of the Mayor and the municipal council. Finally, the action is not isolated but rather is part of the additional awareness raising and capacity building campaigns planned for Rosh Ha'ayin. Therefore, we expect a synergistic effect from the different campaigns that will take place in the city.
10. Next Steps
As the one-star green building code has been approved for new buildings that are in the planning stage, it is vital to define the detailed requirements and enforcement mechanisms to be presented to the contractors as well as to the public. This should be developed in the coming months.
11. Annexes / References to Annexes
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Seminars for professional groups - #4

1. General Presentation

Location	Start date	Project Lifetime
Rosh Ha'ayin	2016	5 years

Project Owner / Lead Actor

Municipality of Rosh Ha'ayin

Contact person

Mr. Shlomo Gispan – head of SH.F.A (city appearance) Wing

Summary of the Action

Lifelong learning activities are a key for the continuous evolvement of citizens and the society. Based on this fact, and taking into consideration the contribution the tertiary sector has on the municipality's carbon footprint, the municipality intends to organize a series of seminars to targeted professional groups in order to promote the concept of energy management and energy saving practices and provide advice on ways to improve at low cost the energy efficiency of the related buildings and facilities.

The municipality of Rosh HaAyin is orientated towards the realization of a series of seminar rounds, where in each seminar a different group of interested stakeholders will participate. These seminars will be differentiated depending on the size of the group of stakeholders being represented, so different solutions will be suggested for small buildings/ shops/ companies, and alternative options will be provided for medium or large size ones.

Since key energy consumers in buildings of the tertiary sector are mainly HVAC and lighting, whose consumption is highly determined by the energy behaviour of the buildings and facilities' users, suggested technical solutions per group of stakeholders may include simple modification of the users' energy behaviour, installation of automations and thermostats, increase of natural light and natural ventilation, use of cool colours, replacement of incandescent or fluorescent lamps with LED etc.

One of the challenges when approaching stakeholders from the tertiary sector is the matter of ownership. In many cases the owner of the building is not the user (the users rent the buildings or parts of them). In this case, the renters pay the energy bill, but are not inclined to invest in the building itself – since it is not owned by them. Replacing windows, adding insulation to the walls and ceiling are options that can save much energy. Some of the owners do not allow changes of this type, even if the renter decides to do so at his expense.

An additional group of stakeholders relevant to the tertiary sector are the management companies. These are companies which manage the building, and in many cases have a "fixed" contract with the building owners as well as with the renters. As their motivations are a little different, a targeted group will be proposed for these stakeholders.

As Rosh Ha'ayin is vastly expanding, new areas of commerce and services are planned as well. Most of the new buildings have not yet been built, and only some have submitted their building plans. Efforts will be made to reach the relevant stakeholders of the new areas and create a separate seminar for them in order to improve elements in the new tertiary sector, both in the interior envelope and in the electricity consumers (lighting, HVAC, etc.) before changes need to be made.

Therefore, it is envisioned that differentiated groups will be held for the different stakeholders. Approaching

the different stakeholders and representing the different motivations is expected to maximize the efficiency of the groups and the dissemination of the information towards better implementation.

The stakeholders will express interest to participate in one of these free of charge seminars through an online application form, and they will be notified depending on their characteristics (size, building use, ownership etc.) on potential dates they can attend the seminar, when the groups are complete. It is considered that over the years at least a 10% of the stakeholders activated in the sector will attend the seminars, achieving through low or no cost actions a 10% energy reduction in their facilities.

General Objectives of the Project	Principal partners and stakeholders
1. *Educate stakeholders from different groups of the tertiary sector on the advantages of Energy Efficiency and the ways to save energy on their site* 2. *Promote using EE products* 3. *Promote improvement to buildings' envelope* 4. *Reduction of the carbon footprint from the tertiary sector*	1. *Sh.F.A. wing, business licensing dpt. and SEAP team of Rosh HaAyin Municipality* 2. *Ministry of Economics* 3. *ministry of National Infrastructure, Energy and Water*
Ultimate beneficiaries of the project	**Link to municipal development plans / urban plans / other municipal or city programs**
1. Businesses across "veteran" Rosh Ha'ayin – small medium and large facilities of the tertiary sector 2. New businesses that have not yet been built	1. This action has been proposed as part of the municipality's SEAP in the tertiary sector. 2. The action is coordinated with the municipal Building Plan that has been commissioned by the Mayor

Estimated investment cost needed	
EUR:	142,900
NIS:	600,000

2. Technical Description

Area(s) of intervention (sectors as specified in the SEAP proposed by CoM)	Main adopted Technology & Equipment
Tertiary sector	The specific action focuses on educational and capacity building groups, and as such it doesn't envisage the adoption of any technology or equipment.

Site / Place	Status of the action			
The action focuses mostly on different types of businesses across town - on existing ones as	**New**	Planned	Under implementation	Following previous action

Start date	Project Lifetime	Previous or linked studies
Mid 2016	5 years	No previous studies have been realised on the action. However, the ministry of Economics, through the small and medium business agency has developed some group projects, some of which relate to Energy Efficiency. The Ministry for National Infrastructure, Energy and Water has also experience with holding seminars, directed more to the larger businesses. Thus these materials could form the basis for preparing the content for the different groups.

Engineering Studies	Not applicable for the specific action
Implementation plan / Construction plan	The action is expected to be organized within 2016 and start its activities within a five year horizon. No construction plan is envisaged.
Other previous	Not applicable for the specific action
Environmental impact assessment	Not applicable for the specific action

3. Organization and procedures

Formal approval	Legal responsible body
The action has been a priority for the municipality and its formal approval is expected early 2016, along with the SEAP approval by the municipal council.	The municipal council is the legal responsible body for approval of the action. Since the action is of educational and voluntary character, no other body will be engaged
Staff allocated to prepare, implement and monitor the action	**Municipal / City Staff Training Needs**
The Sh.F.A. wing (city appearance) with the business licensing dpt. will be engaged in this activity for its implementation and overall coordination. The municipal staff will divide the project into smaller elements. Advertisement, outreaching, brochures, web-site forms for enrolment in the groups according to the different types of groups. The municipal staff will also define the content of each group, no. of participants and no. of hours or meetings necessary. The initial approach will be made by the Mayor and the senior staff (conference for all businesses in town) inviting also interested parties (those who intend to develop businesses in the new part). Additional outreaching will be made by the business licensing dpt. The flyers and brochures will be developed via outsourcing, as well as the	Training needs for the municipal staff are not considered necessary for the action's preparation and monitoring. The staff chosen for the project are knowledgeable and can take on the tasks, taking into consideration that they will have additional staff. It is considered possible to implement with the staff, if they engage additional personnel, as mentioned above (additional man power – half time for monitoring and implementing, together with outsourcing the lecturers and the graphics (brochures and other necessary visual aids). If, however this will not be the case, the use of external consultants will be necessary also for the monitoring, managing and the PR.

lecturers for the groups (experts). The SH.F.A wing will oversee all parts of the action including the tenders needed for the implementation. It is envisaged that for the described mission there is a need for half time engagement (50% employee). In case the capacity building for the different groups will be realized by the municipal staff, then more human resources will be needed.	
Technical Assistance Needs	**Role of Partners**
No technical assistance is required, due to the nature of the action.	• The SEAP team will be in close collaboration with the business licensing department, providing all technical expertise considered necessary, and with the local professionals for the legality of the tenders (how and where to publish, payments etc.) • The Ministry of Economics as well as the Ministry of National Infrastructures, Energy and Water will provide all relevant educational material, while it is also expected to participate with a certain amount to cover the operational costs (for example consultant costs, educational material printing).

4. Cost Estimates

Initial and start-up expenses	EUR: 23,800 (for the preparation of the material) NIS: 100,000	**Net Present Value (NPV)**	**Return of Investment (IRR)**
Operational Costs (approx.)	EUR: 23,800 (for organization and operation of the workshops in an annual basis, including awareness raising) NIS: 100,000	EUR: >>0	As a capacity building and awareness raising activity the calculated NPVs are extremely high. However, no income for the municipality is created by this action and should be considered as an investment by the municipality to its citizens.
Annual Income (approx.)	EUR: - NIS: The action doesn't generate income, but energy savings for the businesses across the city	NIS: >>0	

5. Funding Sources

Funding Source	Fund
Local Authority's own resources	Contribution up to 10% of the project's annual budget
National Funds and Programs	Ministry of Economics and the Ministry of National Infrastructure, Energy and Water resources up to 100,000 NIS
International Financial Institutions	

EU Funds & Programs and other external funds	SUDEP or SUDEP like project
Public-Private Partnerships	
Lined up Private Investments	
Loans and Potential Borrower	
Expected Annual Cost Savings to City Budget	Not Applicable
Other	

6. Projected Energy Estimates in 2020

Energy Savings (MWh/a)	Renewable Energy Production (MWh/a)
2,250 MWh	N/A

CO_2 Reduction (tn CO_2/a)	
Target Year	2020
Net reduction on the Territory	1,350 tn
Reduction as related to BAU Scenario	0.37%
Per Capita calculated reduction	16.9 kg CO_2

7. Summary of Related Awareness Raising (AR) Actions

Awareness Raising related to the Action

Awareness raising activities will be realised to disseminate the upcoming training seminars for the tertiary sector. Letters will be sent by post (and by mail where available) to all businesses, which will invite them to participate in the process. The information will be attached to the monthly bill (city-tax) thus covering all the sector. Info dissemination will be realised through the production of brochures and posters to be presented in central commercial and service areas.

In addition, an opening event will be held led by the Mayor with additional well know, appreciated figures (from the ministries, small and medium business agency and similar). On this day, as well as from the day the letters are sent, the municipal web site will have information on the groups and the relevant forms for signing up.

As the soon as the groups will start, their activity will be published so as to encourage others to join the next groups.

Awareness raising related to the Community

The results of the action at an annual basis will be widely communicated to the citizens to demonstrate the potential for pollution, energy and monetary savings that can be achieved, as well as the efforts being placed by the municipality and the local businesses to turn greener.

8. Assumptions and risks

The main assumption and at the same time risk for the action is the interest of local business and commercial building owners to participate in the trainings, and then to adopt in real life the new knowledge they have acquired. They do not constitute a group, and usually work individually or even in competition with each other.

At the same time, the municipality's resources are very low, and it might be difficult to finance the reaching out process and the awareness raising action of such extend, that brings no direct financial benefits in the municipality.

9. Key Success Factors

Endorsement by the Ministries (Economy and Energy) as well as leaning on additional assistance that is not solely from the municipality (Experts) is considered a key success factor for its success. The fact that the municipality has a constant connection with the potential clients (through the city tax and the registration department) makes the basis for the initial recruitment and therefore is considered also to be an important factor for the action's success.

The interest of the Mayor in the action is high, and it has the full support of the municipal council, although not officially approved yet, as described above.

10. Next Steps

Assignment of the municipal team to work on the project.

Initial plans on the professional groups that will be invited to the workshops as well as the specific thematic areas to cover for each group.

11. Annexes / References to Annexes

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Cycling promotion and creation of related infrastructure - #5

1. General Presentation

Location	Start date	Project Lifetime
Rosh Ha'ayin municipality area	2016	15 years

Project Owner / Lead Actor

Municipality of Rosh Ha'ayin

Contact person

Mr. Shlomo Gispan – head of SH.F.A (city appearance) Wing

Summary of the Action

In the past few years there has been a significant rise in use of bicycle and alternative transportation in the world, and somewhat in Israel. In Rosh Ha'ayin an increased number of riders are using the roads and paths to get to schools, workplaces, leisure activities and more. However, the topography of the city is characterized by hills which might make it difficult to use regular bikes, and thus we see an increase in the use of Electrical bicycles. The use of Electrical bicycles without designated lanes presents high risk both for the riders and for the pedestrians and emphasizes the need to create an extensive bicycle infrastructure.

An additional issue is that in the last few years a growing number of senior citizens (and disabled) have started to use Electric Scooters to get around the city. This is highly relevant in Rosh Ha'ayin since the population in the veteran part of the town is getting older, and the living standards higher. In light of this, combining the scooters in the bicycle lanes might contribute to the wellbeing of the senior citizens and assist in the general traffic flow. At present, the scooters are using the car lanes, a fact which presents a danger both for the elderly / disabled and to the car drivers, while creating a hurdle to the traffic flow.

The width of the average scooter is 90cm and integrating the scooter traffic with the bicycles in the designated lanes needs very little adaptations but can bring a significant improvement to the mobility options of the elderly and disabled.

This particular activity focuses on three distinct levels for the promotion of cycling in the region:

A. Extensive dissemination activities, through information campaigns on the benefits of cycling. These campaigns may include the use of dissemination material, such as flyers, brochures etc., posters or advertisements on the local media (TV, radio). These campaigns will be gradually enriched with information on the infrastructural improvements that the municipality will realize.
B. Creation of the necessary cycling infrastructure (bicycle lanes) across the road network of Rosh HaAyin. This network will be connected with the cycling route leading to Tel Aviv, planned at the governmental level to be realised in the coming years, as well as the train station, in order to ensure connection with major public transport hubs.

As the city of Rosh Ha'ayin is expanding rapidly and vastly, a preliminary transportation master plan has been commissioned. The plan recommends the construction of bicycle-scooter lanes throughout the city.

The aim is to create better connectivity between parts that were planned separately over the years:

- Connecting the old and the new parts of town.
- Emphasis on connecting the veteran neighbourhoods to the new areas.
- Connecting residential areas to central points: employment and commerce, culture, education, transportation areas.
- Improving connectivity with non-motor options to the industrial area (currently separated from the town by route 5)
- Using some of the small roads (low congestion routes) to integrate with the bicycle lanes for better connectivity.
- Maximum utilization of public grounds to create a continuous grid of lanes.

Therefore, the master plan envisages realizing, by 2030, a total of ca. 60km of designated bicycle and scooter lanes. Of which: 14km. along the roads, 38.5 along existing public grounds and 8.5 km in small roads with low traffic.

Average cost for construction of the bicycle lanes per km is around 1 million NIS (238,000 €), thus the total cost for 60km is approximately 60 million NIS (14.3 million €).

C. Establishment of a municipal bicycling sharing program. Within this program's framework, a number of bicycles will be available to the citizens at a low rental price, backstopped by a number of stations throughout the city, where the citizens may get on and off.

The envisaged bike share system is not intended to replace all-day bike rentals, but rather is considered a form of public transit, often complementing bus routes and subway lines. For a reasonable membership fee, charged daily, weekly, monthly or annually, users can unlock a bike from the rack, embark on a journey and return the bike to any station within the system. In some cities, smartphone applications allow users to view station locations and check bicycle availability. Pricing is designed to keep bikes in circulation and provide maximum utility, so short trips are encouraged with a sliding fee system: for example, the first 30 minutes might be free, with charges accumulating for additional increments. Alternative pricing scenarios should be examined at the level of the feasibility study in order to cover the operational costs.

Electric bikes are available at a variety of costs, with prices at around 800€ per piece being considered rational. Considering that 10 stations will be initially developed, with 10 bikes each, the total cost for the bikes is approximately 80,000€, with another 80,000€ for the development of the 10 charging stations.

This initiative is quite ambitious, expands to the 2030 horizon and requires external financing for its implementation.

The action is a significant infrastructure investment that contributes to the improvement of quality of life, even though it is not considered economically viable. Additional indirect benefits should be considered for the project's profitability (the so called externalities) such as attraction of residents and tourists to the municipality, improvement of quality of life, environment and social conditions etc. Therefore, it is considered necessary for the city, even though it brings no economic profit directly to the municipal authorities.

An additional budget of 40,000€ for the awareness related activities and campaigns is considered.

General Objectives of the Project	Principal partners and stakeholders
1. *Educate citizens from all ages on the advantages of cycling, using scooters and riding/driving safety regulation concerning the designated lanes* 2. *Promote using bicycles and scooters* 3. *Reduction of the carbon footprint from transport*	1. *Engineering department and SEAP team of Rosh HaAyin Municipality* 2. *NGO for promotion of cycling (Israel on the route of cycling and similar)* 3. *Ministry of National Infrastructure, Energy and Water* 4. *Ministry of Transportation*
Ultimate beneficiaries of the project	**Link to municipal development plans / urban plans / other municipal or city programs**
1. Rosh Ha'ayin citizens of all ages from youngsters up to the elderly	1. This action has been proposed as part of the municipality's SEAP in the transportation sector. 2. The action is fully coordinated with the municipal transportation Master Plan that has been commissioned by the Mayor

Estimated investment cost needed	
EUR:	14,490,000
NIS:	60,850,000

2. Technical Description

Area(s) of intervention (sectors as specified in the SEAP proposed by CoM)	Main adopted Technology & Equipment
Transportation sector	The specific action focuses on road infrastructure and road plans some new, some utilizing low transportation roads and public grounds. In addition, the action will have an educational part – promoting cycling in all ages and teaching safety rules while using the lanes.

Site / Place	Status of the action			
The action focuses on the whole city, mostly on new roads, but also on existing roads.	**New**	Planned	Under implementation	Following previous action

Start date	Project Lifetime	Previous or linked studies
Mid 2016	15 years	A road Master Plan has been realised, however specific plans need to be presented to the planning committee (regional) to be examined and approved by it. The ministry or Transportation also needs to approve any changes (routes, road signs) Some educational material that needs to be adjusted to the needs (for different ages, bicycles and scooters)

Engineering Studies	Transportation Master Plan has been realized. More detailed studies might be necessary. A feasibility study should be realized in order to study the operational expenses and the required pricing scheme to be adopted for the bicycles' renting. The current project fiche focuses on the infrastructure perspective, and is not financially attractive due to its nature. However, in case all externalities can be measured and taken into consideration, it would give a more accurate idea on the investment.
Implementation plan / Construction plan	Transportation Master Plan has been realized. More detailed plans for construction and implementation will be needed and will be submitted both to the regional planning committee and to the Ministry of Transportation
Other previous	Not available
Environmental impact assessment	Has been realized in the framework of the new neighborhoods planning

3. Organization and procedures

Formal approval	Legal responsible body
The action has been a priority for the municipality and its formal approval is expected early 2016, along with the SEAP approval by the municipal council.	The municipal council is the legal responsible body for approval of the action. Additional approval needs to be obtained from the Ministry of Transportation and from the regional planning committee
Staff allocated to prepare, implement and monitor the action	**Municipal / City Staff Training Needs**
The Engineering wing with the Sh.F.A. (city appearance) wing will be engaged in this activity for its implementation and overall coordination. The municipal staff will be responsible for tendering more detailed plans, and submitting them to the planning committee as well as to the Ministry of Transportation. After approval, they will be responsible for tendering the work itself (construction) and overseeing it. The environment department (under the Sh.F.A.) wing will be responsible for the educational part and awareness raising.	Training needs for the municipal staff are not considered necessary for the action's preparation and monitoring. The staff chosen for the project are knowledgeable and can take on the tasks, taking into consideration that they will have additional staff. However, for the awareness raising it is considered that the employees that are not involved in the SEAP should be the first ones to learn about the advantages of cycling, routes, safety rules etc., and thus become the first group to give personal example. Therefore, it is considered possible to implement with the staff, if they engage additional personnel, as mentioned above. If, however this will not be the case, the use of external

This will be done in cooperation with schools (and the education wing), senior citizens (in coordination with the social workers), employment centers in Rosh Ha'ayin and the general public. The engagement of at least 2 people from the municipality's personnel for the above mentioned actions is envisaged (half engineering wing, half Sh.F.A. wing – including the awareness raising activity).	consultants will be necessary to cover for the necessary human resources needed.
Technical Assistance Needs	**Role of Partners**
There is a need for more detailed plans following the general Transportation Master Plan. This will be tendered to an external expert.	• The SEAP team will be in close collaboration with the engineering department, providing all technical expertise considered necessary, and with the education department for the awareness and safety raising. • The Ministry of Transportation will be in close cooperation for the requirements needed for the lanes, assisting in technical issues, and the approval needed for the plans, road signs etc., while it is also expected to participate with a certain amount to cover the operational costs (plans costs + implementation of paving and signs). • The NGO for the Promotion of Cycling in Israel is expected to play an important role in the motivation and awareness raising in the general public. The NGO will also have knowledge and experience from similar projects they could share with the local SEAP team.

4. Cost Estimates

Initial and start-up expenses	EUR: 14,490,000 NIS: 60,850,000	**Net Present Value (NPV)**	**Return of Investment (IRR)**
Operational Costs (approx.)	Design of the awareness strategy and measures is considered at year 0	EUR: <0	The project fiche focuses on the required infrastructure in order to operate a large network of bicycling roads and a bicycling renting system. As an infrastructure project it is not economically viable. However, in a detailed feasibility study, the appropriate pricing system to be adopted for the maintenance and expansion of the bicycling renting should be examined.
Annual Income (approx.)	EUR: NIS:	NIS: <0	

5. Funding Sources

Funding Source	Fund
Local Authority's own	Contribution up to 10% of the project's annual budget

resources	
National Funds and Programs	Ministry of National Infrastructure, Energy and Water resources up to 100,000 NIS Ministry of Transportation
International Financial Institutions	
EU Funds & Programs and other external funds	SUDEP or SUDEP like project
Public-Private Partnerships	
Lined up Private Investments	
Loans and Potential Borrower	
Expected Annual Cost Savings to City Budget	Not Applicable
Other	Grants from companies in the framework of corporate responsibility for the purchase of some bicycles. Display of these providers' brand names in billboards in the charging stations.

6. Projected Energy Estimates in 2020

Energy Savings (MWh/a)	Renewable Energy Production (MWh/a)
722 MWh till 2020 5,670 MWh till 2030	N/A

CO_2 Reduction (tn CO_2/a)	
Target Year	2030
Net reduction on the Territory	1,413 tn
Reduction as related to BAU Scenario	0,38%
Per Capita calculated reduction	17.7 kg CO_2

7. Summary of Related Awareness Raising (AR) Actions

Awareness Raising related to the Action
Awareness raising activities will be realised broadly to disseminate the importance of cycling. Lectures, special information days, production of brochures and posters to be sent by post to houses and be visible in all municipal buildings and schools. Radio short messages in the initiative may also be utilised as well as direct outreaching through organized groups such as pupils, youth movements, sports centres and more. The activities will promote cycling, and also teach how to use the lanes, what safety issues should be taken into account (such as how to cross junctions safely, how to use the low traffic lanes, learning the road signs). For the elderly (or disabled) using electric scooters separate information days will be realized, which will also include both the awareness raising, as well as the safety issues mentioned above.
Awareness raising related to the Community
The results of the action at an annual basis will be widely communicated to the citizens to demonstrate

the potential for pollution, energy and monetary savings that can be achieved, as well as the efforts being placed by the municipality to turn greener.

8. Assumptions and risks

The main assumption and at the same time risk for the action is the interest of local citizens of all ages to adapt to using bicycles and scooters instead of cars.

In addition, safety is of the utmost importance, and accidents involving bicycles and scooters present a risk in this case.

At the same time, the municipality's resources are very low, and cannot finance this action – planning, paving and awareness raising without the involvement and grand contribution from sources external to the municipality.

9. Key Success Factors

Commencing the detailed programs, getting the relevant plans approved, paving and awareness and safety raising, are all needed for the success of the action.

Raising the funds and appointing a devoted professional to lead the project on a day to day basis is considers a key success factor. The number of participating citizens depends on the quality of the paths, the safety and their location.

The interest of the regional authority in the action is exceptionally high, and it has the full support of the municipal council, although not officially approved yet, as described above.

10. Next Steps

Development of the feasibility study for the operation of the bicycling sharing stations

11. Annexes / References to Annexes

1. *Reference: Map of planned cycling routes (from the cities' Transportation Master Plan)*

ANNEX D – Citizens Awareness Promotion Plan (CAPP)

Rosh Ha'ayin

Life is good when the Heart is green!

Preparing and including the "Awareness Raising Actions" component in the SEAP

In addition to the requirement linked to the public consultation of the SEAP, a Citizen Awareness Promotion Plan (CAPP) has to be elaborated by the municipality as part of the Sustainable Energy Action Plan document (SEAP).

Identification of CAPP actions through participatory training workshops

The CES-MED communication expert has handed and reviewed a three parts CAPP "Communication Kit" with the SEAP Consultant, who got acquainted with its content and used it in preparing this CAPP Plan, in close involvement of the SEAP municipal team.

The "Communication Info Kit" (annex1) includes:

- *Part 1: the "CAPP Guidelines" document: a tailored comprehensive manual prepared by CES-MED for the use of cities/municipalities on how to identify, plan and conduct awareness raising actions (Arabic, English and French versions)*

  (http://www.ces-med.eu/images/CAPP/Annex_7_CAPP_v.4.0_02122014_EN.pdf).

- *Part 2 includes:*
  - *PPT Presentation of the CAPP Guidelines*
  - *Presentation of "how to prepare and implement a communication and an awareness campaign" showing techniques, materials and models*
  - *Pools of benchmark examples and references to best practices from across the world towards citizen engagement and behaviour change, with adaptation to the CES-MED cities context*
- *Part 3 consists of 4 Tables to assess CAPP conditions and identify actions:*
  - *Table 1 is used to conduct a rapid investigation to identify awareness situation, levels and needs linked to behavioural change in the city; and to initiate discussions with the workshop participants towards the identification of target audiences and the SEAP CAPP actions.*
  - *Table2: presents the content of a plan to implement a CAPP action related to a Pilot Project.*
  - *Table 3 presents the proposed actions related to the general sustainable energy challenges and to the city.*
  - *Table 4: presents the proposed CAPP actions linked to each SEAP priority projects.*

Awareness raising conditions and challenges, communication concepts and CAPP methodologies, tools, techniques were discussed and assessed, prior to specifying the SEAP's CAPP actions, whereby the local authority general awareness raising needs and SEAP's priority actions (proposed

in the Project Fiches) were looked over and proposed. In doing so, the attached template tables were filled and thoroughly reviewed, finalized and included in the SEAP.

The Communication Info Kit and specially the CAPP Guidelines are to be used as reference work manuals for the subsequent detailed planning and implementation of the CAPP actions proposed in the SEAP document and other similar awareness raising actions.

Preparation of COMMUNITY AWARENESS PROMOTIONAL PLAN (CAPP)

Template 1- Situation analysis of Rosh Ha'ayin

Aim

The questions in the attached templates cover various areas of actions and levels of awareness linked to behavioural change. It has been used to conduct a quick investigation on the awareness situation and level of perception of the citizens in the city concerning renewable energy and energy saving.

The exercise of filling the templates has identified and assessed the conditions in the municipalities prior to preparing a CAPP and to answers a number of questions, including:

1) Who is the target audience of a CAPP?
2) What are the priority issues to be addressed by the CAPP (that also could be identified by the SEAP as priority actions)?
3) What is the level of awareness of key energy problems? And what are the first issues to raise awareness about?
4) What are previous awareness raising actions, so that the CAPP can build on them?
5) What is the situation as related to public consultation, based on which a public consultation is to be designed?

The exercise of filling in the template helped pointing out how raising awareness can be utilized as a tool for improved energy policy to facilitate implementation of its actions; it has allowed initiating discussions in the Communication Workshop and helped identifying appropriate campaigns and actions.

Specific objectives:

(i) Provide the necessary information about the current conditions and the situation regarding awareness of energy saving and renewable energy,
(ii) Help to identify the most appropriate a) **awareness raising campaigns** that would accompany the SEAP vision/strategy and b) the **awareness raising actions** that would accompany the priority actions determined in the SEAP.

Steps to follow:

(i) The SEAP team of the municipality has filled the templates based on their understanding and perception of the city's inhabitants. They were free to seek the opinion of a limited number of persons to help filling in the answers.

(ii) The filled in templates were discussed in the "CES-MED Communication Workshops", which were led by CES-MED Communication Expert and attended by the SEAP consultant and the SEAP municipal team. In parallel, the vision/strategy of the city and the proposed pilot actions in the SEAP were reviewed as part of the workshop exercise.

The outcome guided the selection of the most appropriate awareness raising campaigns and actions of the SEAPs including the ones related to priority projects.

I. Identification of the target audience and the importance they give to Sustainable Energy (audience targeted by the awareness raising campaigns and actions)			
Age group	Very important	Important	Not important
Women	X		
Youth	X		
Middle Age (with families)	X		X
Seniors		X	
Other			

II. Identification of priority issues to be addressed by a sustainable energy action and their level of importance			
Issue	Level of importance		
	Very important	Important	Not important
High price of energy	X		
Availability/lack of energy	X	X	
Availability of transport	X		
Waste management		X	
Clean environment (translated to air pollution)	X		
Other			

III. Identification of level of awareness (energy problems) and education of energy related issues			
	Very aware (through media or research)	Aware but not convinced	Not Aware
Impact on environment (air pollution from energy production)		X	
Cost of energy		X	X
Waste of energy		X	
Climate change translated to climate change and global warming)		X	
Ways to save energy consumption		X	
Existence of renewable energy		X	X

IV. Previous awareness actions conducted by the city/municipality or by other actors	
Has the city or local authority done previous actions	Yes, in source separation of waste. In addition to extensive work on waste separation, there has also been projects relating to Energy Efficiency – replacing old and inefficient street lights, automation in public buildings for shutting lights / AC in empty places. In 2011 RHA joined Tag Hasviva program (commitment for reduction + audit in the municipal buildings and street lights). As well as few awareness raising activities on waste management and also on energy savings.
If yes, who conducted the actions (the city/municipality, NGO, national authority…)	The local municipality and the Ministry of National Infrastructures, Energy and Water Resources.
If yes, describe the action	Advertising on billboards, in newspapers, explanations in homes (door to door) regarding waste separation. Advertising in the media, regarding the switch to EE products (L.E.D.) for electricity, as well as a waste separation project.
If yes, what was the budget and how did you fund it	The actions have been funded up to 80% from the ministry of environment, and by 20% with the municipality own budget. Total budget of 10,000,000 NIS
If yes, outcome, impact and feedback	We are in the process of raising the awareness and participating in the waste separation, and yes, there is a positive feedback even if most the citizens don't sort waste.

V. Public consultation	
Does the city practice public consultation?	Of course, as RHA has a very active environment committee – between 15-20 participants. The committee is obligatory by law (national level), but here it's very active. It consists of citizens that are involved, and the chair person is a municipal council member, holding the environment "file" (officially and practically). The members are from education or environment sectors, heads of quarters (the city is divided into quarters, each has a head and some members), NGOs etc. In addition, they took a course for "active green citizens". In this specific case, the group was for women, they were presented with the BEI, SEAP outline, and added their input, which then was incorporated in the plan.
Has the city done public consultations for SEAP?	The BEI has been presented both to the environment committee – as explained above, as well as to all the municipal council members (designated by the public in the last elections). Both groups were also presented with the outline of the SEAP, and were asked to give their input, remark etc. which has been incorporated accordingly.
Is it part of the legislative process?	Yes. By law the environment committee must meet, and they do so very actively. They also have different subjects they discuss, in sub-committees, and bring the conclusions to the full committee's forum. At the conclusion of each meeting the protocol becomes public (on the municipal web-site). In addition, if and when the committee has recommendations for the mayor, they pass it to the city management, as a formal recommendation.
Foreseen consultation(s)	Yes, because every part of the SEAP that needs to be implemented needs a budget. As such it has to get approved by the city council, both when the annual budget is approved, and when special projects are added during the fiscal year.
Does the city liaise with national institutions, stakeholders?	Yes, the city has extensive contacts with national institutions. There is close contact with the ministry of Energy, especially with the department for Energy Efficiency and Energy Conservation. The head of this department acts as the Focal Point for the CES-MED program. In the same department there is also the person responsible for the education, and RHA is in close contact also with her. Both meet with the municipal staff every few months. In addition, one of the action plans that is being implemented (10% reduction in schools) is led by the ministry of Energy, with their financial and professional support (the same department). Moreover, there is close contact with other ministries- education, transportation, interior, economy and more. Additional Stakeholders: cooperation is commenced with local and national NGOs that are relevant for protection of the environment; energy; safety and transportation; bicycles and more.

Situation analysis

From this study concerning the target groups and profile, it appears that mainly the women, middle aged citizens with families and young people give a high importance to sustainable energy and seem to be impacted by awareness actions they were exposed to. It would be recommended to carry out the communication with them and get their involvement as they could function as opinion sharing people to disseminate ideas and new behaviour.

The senior's generation is the group that is the less aware or informed about issues related to this subject. It will need more persuasion to suppress ambiguity and change their perceptions and behaviour through awareness raising actions.

Concerning the identified priority issues and their level of importance, the templates show mixed results and records; the population of Rosh Ha'ayin gives high significance to sustainable energy actions related to the price of energy and its availability, to transport issues and the cleanliness of environment, but not to the management of waste.

However, the difficulty lays in the fact that the population doesn't seem very convinced by all issues concerning climate change occurring and the impact on environment, cost and waste of energy and ways to save it, even less by the existence of renewable energies to reduce their negative impact. Even if it is aware of the challenges, it remains sceptical.

Nevertheless, the municipality of Rosh Ha'ayin has conducted few awareness raising activities and campaigns related to waste management and energy savings; the process is still going on yet, the involvement of the population has not been attained in terms of change of behaviour.

The means and tools of communication used were mainly advertising on billboards, in newspapers, and in an interesting way, a door to door strategy. These actions have been funded jointly by the ministry of environment and the municipal budget.

Finally, regarding public consultations, being part of the legislation of the city, they have been well carried out by a very active environment committee. The SEAP and BEI have been presented to municipal council members and their comments have been integrated. Following this procedure, the protocol went public on the municipality website.

This participative approach, requires that every action and budget needs approval by the city council and is considered crucial for the targeted achievements; moreover, the city is initiating communication and cooperation with the respective institutions, the ministry of energy, the project experts, and several NGOs.

Template 2

Proposed Communication or Awareness Raising Action related to Specific/Pilot Project: Cycling is fun!

1. **Title of the Pilot Project**

   Cycling and Scooter promotion

2. **Title of the Communication Action related to the pilot project**

   Cycling is fun and healthy

3. **Location**

   All around town, specifically where bicycle / scooter lanes have been developed

4. **Summary of the Communication Action**

General Objectives:

- Save car congestion especially in the center of town and in all areas where relevant infrastructure has been built. When the full plan of lanes will be implemented the target is to reduce 1400 tn CO_2 annually. The respective action fiche by 2020 focuses on reduction of 180tn through a bicycling paths network of 10km. The target till 2030, as this action is a long term one, is 60 km of cycling paths and overall 1,413 tn reduction of CO2 emissions.
- Increase the independence of handicapped or elderly people who use electric scooters

Specific objectives:

- Connecting the old and the new parts of town.
- Emphasis on connecting the veteran neighbourhoods to the new areas.
- Connecting residential areas to central points: employment and commerce, culture, education, transportation areas.
- Improving connectivity with non-motor options to the industrial area

Key message:

Contribute to your health, as well as the environment's

Theme:

Get on board for a better environment

Target group:

People of all ages in Rosh Ha'ayin, specifically children, teenagers, men and women of all ages. In addition, since the lanes are to be built to accommodate both bicycles and electric scooters, another important target group is the elderly and disabled.

Tools and channels:

In the past few years there has been a significant rise in use of bicycle and alternative transportation in the world, and somewhat in Israel. In Rosh Ha'ayin an increased number of riders are using the roads and paths to get to schools, workplaces, leisure activities and more. However, the topography of the city is characterized by hills which might make it difficult to use regular bikes, and thus we see an increase in the use of Electrical bicycles. The use of Electrical bicycles without designated lanes presents high risk both for the riders and for the pedestrians and emphasizes the need to create an extensive bicycle infrastructure.

An additional issue is that in the last few years a growing number of senior citizens (and disabled) have started to use Electric Scooters to get around the city. This is highly relevant in Rosh Ha'ayin since the population in the veteran part of the town is getting older, and the living standards higher. In light of this, combining the scooters in the bicycle lanes might contribute to the wellbeing of the senior citizens and assist in the general traffic flow. At present, the scooters are using the car lanes, a fact which presents a danger both for the elderly / disabled and to the car drivers, while creating a hurdle to the traffic flow.

This particular activity focuses on several distinct levels for the promotion of cycling in the region:

A. Creation of the necessary cycling infrastructure (bicycle lanes) across the road network of Rosh Ha'ayin. This network will be connected with the cycling route leading to Tel Aviv, planned at the governmental level to be realized in the coming years, as well as the train station, in order to ensure connection with major public transport hubs. As the city of Rosh Ha'ayin is expanding rapidly and vastly, the lanes will be developed in the veteran part as well as in each of the new neighbourhoods, as they are being built. The full realization of the lanes is envisaged by 2030.
B. Extensive dissemination activities, through information campaigns on the benefits of cycling. These campaigns may include the use of dissemination material, such as flyers, brochures etc., posters or advertisements on the local media (TV, radio). These campaigns will be gradually enriched with information on the infrastructural improvements that the municipality will realize.
C. Competitions, riding groups, courses regarding riding safety, after school and weekend activities, info days, cross city rides (twice a year).
D. Establishment of a municipal bicycling sharing program. Within this program's framework, a number of bicycles will be available to the citizens at a low rental price, backstopped by a number of stations throughout the city, where the citizen may get on and off.

   The envisaged bike share system is not intended to replace all-day bike rentals, but rather is considered a form of public transit, often complementing bus routes and subway lines. For a reasonable membership fee, charged daily, weekly, monthly or annually, users can unlock a bike from the rack, embark on a journey and return the bike to any station within the system. In some cities, smartphone applications allow users to view station locations and check bicycle availability. Pricing is designed to keep bikes in circulation and provide maximum utility, so short trips are encouraged with a sliding fee system: for example, the first 30 minutes might be free, with charges accumulating for additional increments. Alternative pricing scenarios should be examined at the level of the feasibility study in order to cover the operational costs.

This initiative is quite ambitious, expands to the 2030 horizon and requires external financing for its implementation.

5. Organization

Roles and responsibilities:

The communication Team: the project will be led by the SEAP municipal team led by the head of the RHA wing (city appearance). He will coordinate the project with the CES-MED municipal team as well as with additional departments relevant to the action specifically the engineering wing and the Education wing.

In addition to the infrastructure development, the team will be responsible for the awareness raising and educational activities related to the action.

Project lifetime: 5 years for the awareness raising, safety courses, competitions etc., and 15 years for the full implementation of the lanes.

Link to other opportunities and/or events:

The project will be published on the website, Facebook, and after it will start having an effect also on billboards. The school activity will be published in every school, in flyers sent to the pupils' homes, on each school's website, short bulletins via WhatsApp messages.

There will be a competition between the schools as to which school has more children arriving to school on bicycles, which have more of the staff leaving their car at home. The winning school will receive helmets to give away to the students.

An afterschool riding activity will be held for different ages, with routes relevant to the participants' age.

Weekend bicycle trips will be organized for different groups: families; professional riders; women group and other interest groups such as photographers, bird watchers etc., bi-yearly cross city rides.

Principal partners and stakeholders and their roles:

The mayor, the municipal SEAP team, municipal employees, volunteer groups, school masters, teachers, parents, after school activity leaders. In addition, the municipality will invite NGOs relevant to bicycle riding (15 minutes NGO and similar).

Staff training needs:

Since this project aims at reaching a large portion of the population it's quite a big operation. The engagement of at least 2 people from the municipality's personnel for the above mentioned actions is envisaged (half engineering wing, half RHA wing – including the awareness raising activity). If it is not possible to assign such employees, it will be important to receive assistance from an outsourced professional that will head the project with the assistance of the municipal departments. The complexity of the project is such that the present staff cannot manage it in addition to their current jobs.

Technical assistance and expert needs:

The technical issues can be addressed by the local staff. In addition, there is need for an expert in PR and graphics – it's important to have a good logo for the project, a good visual campaign, someone who will be responsible for the flyers, website, magnets for all activities (formal and informal) and the marketing needed for the project

6. Cost estimate

Estimated implementation cost: The estimated implementation cost is 168,000 NIS for the awareness raising component over a 5 years' period;

Funding source: It will be funded by municipal budget; government – ministry of energy, transportation, environment, education; Grants from companies in the framework of corporate responsibility for the purchase of some bicycles, SUDEP or SUDEP like project.

Initial and start-up expenses and approximate operational Costs:

Initial cost for infrastructure for the 10km of bicycling paths by 2020 is approximately 10 million NIS.

The engagement of at least 2 people from the municipality's personnel for the above mentioned actions is envisaged (half engineering wing, half RHA wing – including the awareness raising activity). If it is not possible to assign those employees, it will be important to receive assistance from outsourced professionals that will head the project with the assistance of the municipal departments. The complexity of the project is such that the present staff cannot manage it in addition to their current jobs.

A number of man/day for graphic and PR professional (logo, flyers, website, billboards, newspapers, magnets)

7. Next steps

Approach Donors in order to secure financing for the action

8. Follow-up, evaluation and impact assessment

It is important that the diverse activities continue all year long, creating interesting activities aimed at different audiences.

The school competition should be annual and ongoing. The data from the competitions (number of children and teachers arriving by bicycles) will give us the general numbers to be compared between the schools, and over the years. Additionally, data will be collected on the no. of the bicycle rentals. If the numbers start reducing additional boosts should be given, for example an additional short course or some lectures for the teachers and headmasters, maybe a play or important movie for the pupils.

Template 3.1

Identification of CAPP CAMPAIGN TOPIC related to sustainable energy challenges

Once the Sustainable Energy challenges and priorities, general awareness raising priorities, and specific awareness raising needs related to SEAP actions have been identified, the CAPP's main areas of intervention and activities can be defined. The table below portrays the challenges, priorities and related AR activities.

Challenges:	Priorities:	Awareness Raising Priorities, Topic & Activities of CAPP Campaign
The 10% commitment campaign for schools- **Municipal sector**	Bring change to the consumption habits of students and teachers as well as to their behaviour to sustainable energy, without any investments on energy efficiency equipment.	**Topic**: **Delivering reliable information about the saving, the process and sustainable consumption of all types of energy production –including oil, coal, PV.** **Activities**: Instigate a volunteering action campaign, where schools choose to commit to a target of at least 10% reduction. Launch a contest between the participating schools, identifying the one achieving the highest energy saving percentage. Schools that achieve the commitment will receive an honorary praise. The school to win the contest and its students will receive the School Energy Cup by the Mayor in an open ceremony, while the financial resources saved for the municipality will be invested in the school for simple energy efficient projects. Initiate lessons and thematic energy days, where dedicated professionals will be invited as well to explain the benefits for the environment and the significance of preserving energy. Advertise all activities on the municipal website, all schools' sites, billboards across the city, and in all the municipality owned buildings. The campaign will be presented in professional days in the city and on the national level.

Campaign for substitution of old A/Cs and lamps- Residential sector	Promote production of clean energy.	**Topic**: **Raising awareness and capacity building, educating and informing users and professionals before the construction of the new neighbourhood.** **Activities**: Initiate information days for citizens on the importance of purchasing new and EE appliances (Energy labels). Compile a list of recommended appliances, and where they can be bought with subsidies (creating the system where the subsidies will be distributed to the largest number of households in RHA). Advertising the actions on municipal website, local newspaper, schools, local radio. Send door to door representatives (coordinated by the municipality) to show residents how to replace light bulbs (which are the most consuming in their homes); which A/C they should replace first (which is the most inefficient).
Subsidized energy audits at a volunteer basis- Industrial sector	Reduce voluntarily the emission and consumption in the industrial sector. Promote the "Energy friendly business" label in companies. Bring change to the consumption habits of industries and businesses as well as to their behaviour to sustainable energy, by practicing eco responsibility.	**Topic**: **Provide civil society with some practical tips on how to save energy in their homes. Mobilize them to act immediately and every day in reducing their bills.** **Activities**: Reach out to the industrial sector, inviting them to have subsidized audits, then create small groups from different sectors for active training seminars. Target the integration of principles of sustainable development into educational programmes adapted to each profession. Accompany each learning participant in the group to implement energy saving in his industrial facility. Give special emphasis and assistance in raising awareness and PR inside the participant's company as well as outbound – stakeholders, shareholders, supply chain etc., as to the challenges of sustainable development. Select proper channels such as the intra-net, billboards, lectures and info days in the companies; the website and advertising material (giveaways) for the outwards clients.

Template 3.2

CAPP activities as related to SEAP Priority Actions of Rosh Ha'ayin

This template will guide the municipality in the implementation of a strategy and the identification of adequate awareness raising activities according to the target group and its needs and related to the priority actions identified in the SEAP.

SEAP Priority Actions	Related CAPP Activities:
1. Awareness raising campaigns to reduce the amounts of organic waste- **Municipal Buildings, Equipment / Facilities**	**Target Audience:** - Civil society, more specifically children - Government agencies and associations - Private and public touristic operators - Service providers in the private and public sectors - Professionals in energy sector **Key Message:** - Let's cut down on organic waste, it is pouring out! **Objectives:** - Appoint a dedicated team and establish a communication unit to communicate with citizens, all stakeholders and other municipalities. - Promoting the project and the strategic vision of the city at local, national and international level in the clean energy sector. - Connecting with concerned international actors and organizations (donors, professionals abroad…) - Increase the awareness for reducing the thrown amount of organic waste and the amounts of food being discarded with a focus on recycling as a combative measure. **Communication Tools:** Disseminate messages through radio programmes, newspapers and television, especially benefitting from local media to promote this action; produce promotional material (leaflets, brochures, posters) and perhaps billboard advertisements. Launch Municipal highlight day with activities mostly targeted at children showing them how much organic waste is being discarded, where does it go, why is it important. Produce and disseminate educational kits - with a view to teaching young people how to recycle and reuse waste. Organize special events for school children (competitions, compost days). Conduct environmental projects and trips to the waste management facility to give students the opportunity to learn and explore new technologies and concepts that could aid environmental sustainability. Relevant movies will be shown – in schools for the children, in

	theatres for the adults. Lectures that can showcase how the reduction can be implemented and has been in some places in the country. Using the municipality's websites, producing posters. Producing posters on pick-up trucks for high visibility Provide practical tips to reduce solid waste at its source, to re-use and recycle: a small guidebook and calendar.
2. Municipal lighting system upgrade- **Municipal lighting sector**	**Target Audience:** - Civil society. - Private and public operators. **Key Message:** - The municipality can be a pioneer and become energy friendly. - Installing energy saving lighting would help the city on the economic and environmental levels and saves in the Municipality lighting bill of its annual budget. **Objectives:** - Update of the lighting system infrastructure by introduction of LED technology and gradual replacement of old light bulbs. - Modification of the lighting grid's density and better maintenance of the system - Promote the installation of similar equipment in other urban common areas. **Communication Tools:** Announcing, through the various available tools, the update of the lighting system infrastructure, the size of savings and the advantage of reusing the money saved in social and public projects. All actions will be accompanied by visual information – on the poles, on electricity exchange boxes, in the municipal and local media. The information will include data on the importance of the project, it's target, the advantages of LED, savings expected in %. Promoting the usage of efficient lighting in households through distribution of led lamps. Training to the students (primary and secondary schools) on using the energy correctly. Creating an info center to inform citizens about new technologies.
3. Promotion of green buildings' concept- **Residential Buildings Sector**	**Target Audience:** - Civil society, home owners; tenants; new residents planning to arrive at the city, professionals and developers involved. **Key Message:** - Become green and socially responsible while saving energy - You have the power to switch off the power

	Objectives: - Reduce the energy cost in households - Encourage a change in behaviour by simple actions **Communication Tools:** The activities will be targeted by the segmented groups Information days and short courses to enhance capacity building for professionals in the building field (architects, roofers, window companies, external home painters, A/C and electrical appliances suppliers, insulation etc.) Establish a green mark certification for buildings, restaurants, offices, supermarkets, etc. Launch a public information campaign, including programs which provide "energy tips" and counselling, energy consumption feedback and assessments, elementary school programs, and mass media motivational campaigns. Initiate awareness activities in the local media (local newspapers, TV and radio), as well as distribution of dissemination material (flyers, brochures etc.). Produce and disseminate an information brochure including a brief cost estimation and analysis, explaining the benefits of green buildings to the citizens (improvement of living conditions in the house and more importantly from their contribution in decreasing energy related costs and bills and all benefits on the long term). Launch an evaluation of energy saving in existing buildings by professionals who will assess the necessary changes: need to install shadings, roof insulation, painting of the buildings' facade and roofs with cool colours, to reduce thermal absorption. Produce a guidelines brochure for new buildings, to be used at the design phase (optimal orientation of the building, the need for increased natural lighting and natural ventilation, inclusion of a minimum level of insulation in the buildings' exterior surfaces, shading in the glazing…).
4. Seminars to professional groups- **Commercial buildings, equipment / facilities**	**Target Audience:** - Civil society. - Private and public operators. - Energy experts in the municipality, industries, utility companies. **Key Message:** - Professionals can make a difference in improving our environment's carbon footprint. **Objectives :** - promote the concept of energy management and energy saving practices and provide advice on ways to improve at low cost the energy efficiency of the related buildings and facilities. **Communication Tools**

	Set up exhibitions or demonstration fairs to all stakeholders in the construction and tertiary sector. Launch the "Green Leaders" program as a professionals' engagement program that capitalizes on the enthusiasm and ideas by offering volunteer opportunities to those who want to act on their sustainability values in the workplace. Organize a series of seminars to targeted professional groups: the realization of a series of seminar rounds, where in each seminar a different group of interested stakeholders depending on its size will participate. Different solutions will be suggested for small buildings/ shops/ companies, and alternative options will be provided for medium or large size ones (applications will be done through an online form). Produce an information leaflet to key energy consumers in buildings of the tertiary sector (mainly HVAC and lighting, whose consumption is highly determined by the energy behaviour of the buildings and facilities' users), to suggest technical solutions per group of stakeholders; this may include simple modification of the users' energy behaviour, installation of automations and thermostats, increase of natural light and natural ventilation, use of cool colours, replacement of incandescent or fluorescent lamps with LED etc.
5. Cycling promotion and creation of related infrastructure- Transportation sector **(see template 2)**	**Target Audience:** - Civil society - Private and public stakeholders **Key Message:** - Reducing the costs, limiting time and reducing the greenhouse gas emissions and their impact on health and on the environment. **Objectives :** - Reduce the fuel consumptions and congestion - Cycle for your health and for your city **Communication Tools** Launch a public information campaign about the benefits of cycling, the creation of the necessary cycling infrastructure (bicycle lanes + electric scooters) across the road network of Rosh HaAyin and the establishment of a municipal bicycling sharing program (Within this program's framework, a number of bicycles will be available to the citizens at a low rental price, backstopped by a number of stations throughout the city, where the citizen may get on and off). Promote through information campaigns and dissemination material all the above as well as infrastructural improvements that the municipality will realize, events around the cycling theme, competitions… using flyers, brochures posters and mostly through advertisements on the local media (TV, radio). Introduce a spokesman such as a star or a fitness coach to embark on a journey with the public. Instigate a competition between schools (students and

	teachers) as well as after school activities for the parents as well (riding groups for different ages and different interest themes). Courses on safety and the relevant regulations Launch two marathons events of municipal ride similar to running events with different routes (length and difficulty).

Recommendations:

These tables have been thought and prepared by the communes and municipalities. In this approach, they aim to promote in a particularly innovative and ambitious way local community's response to current challenges identified in the SEAPs, notably in the management of energy and the promotion of renewable energies. They allow us as well to identify the most appropriate communication actions to reach the local community.

In the case of Rosh Ha'ayin specifically, awareness-raising should be carried out on several fronts to encourage, motivate and alert civil society:

On one hand, the senior target group seems to be very suspicious about the literacy around the energy topic. The best way to anticipate the barriers that affect their choices and behaviours would be to provide them with information that explain how such savings can be realized, together with practical advice wherever possible, and involve them in a higher degree of interactivity including rewards or a system of incentives.

On the other hand, women, young people and middle age citizens are high dynamic and could realize face changing situations; they are clearly educated to the energy issues and climate change; it is essential to endorse their processes of perception regarding renewable energies information and shape it with educational approaches so that they will become the cornerstone of energy saving.

Rosh Ha'ayin municipality and its mayor seem to be a very active force, setting various challenges and aiming at meeting them. However, mapping the collaboration possibilities is a key step for the municipality in the preparation of the communication strategy on energy savings. Therefore, cooperation with housing associations and associations of house owners can be a door-opener to address citizens directly and to have a partner that represents the citizens' interests directly. They could have the role to inform the households about the energy use and energy savings and can provide concrete measures for more efficient energy consumption.

In order to create the conditions required for a change of model in favour of sustainable forms of consumption, there are certain leverages we could use and base our communication upon such as those mentioned in the following paragraphs.

Citizen education and training; instigating training as one of the integral parts of sustainable development for pupils from primary school to upper secondary is recommended; Higher education establishments would also be involved this approach towards sustainable development. In this respect, the different levels and age groups could be asked to draw up a "green vision" for their city in a competition-like action.

To complement this process, and accompany as many citizens as possible on the road to sustainable development, awareness actions, events and information and education programmes on the environment and sustainable development, would be proposed for all types of audiences.

Effective partnerships and intensive collaboration with stakeholders, could lead to a successful implementation of energy saving measures. It means involving citizens, environmental/ energy/ educational organizations as well the local authorities, energy companies and the media.

Energy agencies can provide advice on a large range of topics. Local initiatives and NGOs have good contacts to the public and know how to address them effectively. Public utility companies and service providers are a target group that can help distributing information, e.g. by printing information on the energy bill.

The initial objective is to help as many people as possible to understand that they too have a role to play, and to give them ideas for their day-to day lives with their families and with their friends, and all this with an entertaining pitch. Such as an Energy Challenge, between Teams of participants who would compete by generating “electricity” by exercising on an elliptical trainer or stationary bike. This would bring greater awareness to the amount of effort needed to generate electricity and provide power for everyday work tasks as the winning team is the one that generates the most watt-hours over the competition period.

Last but not least, encourage the municipal Council to put in place a communication cell that will prepare a communication component guide which will incorporate specific measures in the policy of the city on how to reduce energy; Adopting a comprehensive communication strategy adjusted to all stakeholders (Professional, head teachers, youth movements, religious leaders, associations...) and use the adequate medium to deliver its message and lead the people in their choices towards a change in behaviour.

The European Union is made up of 28 Member States who have decided to gradually link together their know-how, resources and destinies.

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