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CES-MED

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● Israel Municipality of Ramla Sustainable Energy Action Plan (SEAP)





Municipality of Ramla

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Sustainable energy action plan (SEAP)

Municipality of Ramla

- Israel –

**Integral document of the sustainable
energy action plan**



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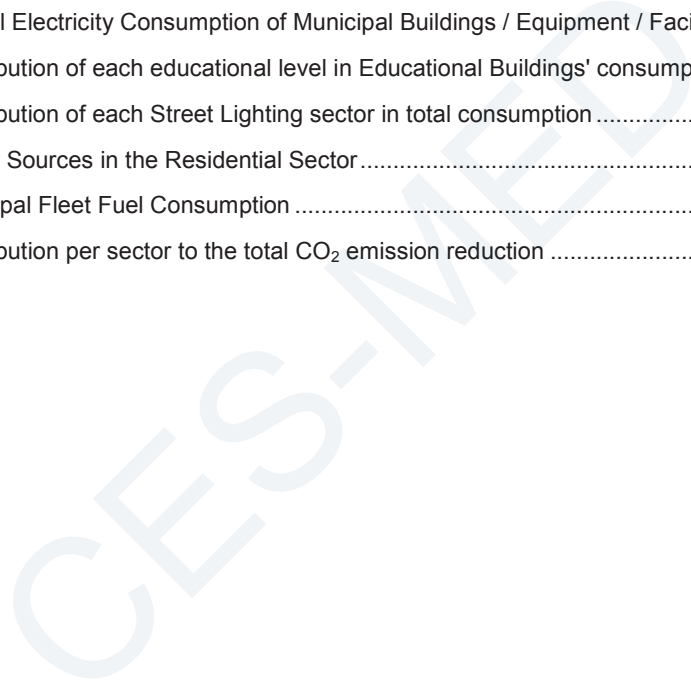
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Executive Summary

Israel has been many times characterized 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 Ramla 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% and has also signed the Israeli Initiative Tag HaSviva. The municipality has been selected from the CES-MED EU programme to have its SEAP funded, due to the Mayor’s commitment on energy sustainability with the CoM signature.

Ramla intends to continue improving the city to be clean, healthy, and safe, with the highest quality of life and environment for its citizens. Every year millions of Shekels (NIS) are invested to promote and develop the city, to build infrastructure and new neighbourhoods, to develop new green areas gardens and to create a vibrant community and cultural life.

During the SEAP implementation, the Municipality of Ramla 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 involvement of all citizens and stakeholders of the municipality 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, the existence of large scale industrial consumers indicates the need to achieve a high level cooperation with their representatives, in order to achieve an important reduction in emissions from the industrial sector.

The total target of the SEAP implementation is to reduce the Carbon footprint of the Municipality with a total reduction of 231,954.27 tn CO₂ by 2020, which is 20% of the municipality’s total emissions under the BAU scenario.

For the implementation of the SEAP the total budget is 653.22 million NIS, including private funds to be mobilized. The budget excluding the funds from private actors is 70.42 million NIS and the Municipality of Ramla will contribute to this with around 10%. 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 mobilised through the SEAP proposed actions.

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 Ramla included in the Baseline Emissions Inventory all the compulsory sectors and three optional sectors:

- 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 (CH₄) emissions that are produced from the landfilling process.

The energy consumption occurs mainly from the Private transport sector, while the Residential and Commercial buildings sectors are following. The total energy consumption in the Municipality of Ramla is presented in the following spider chart:

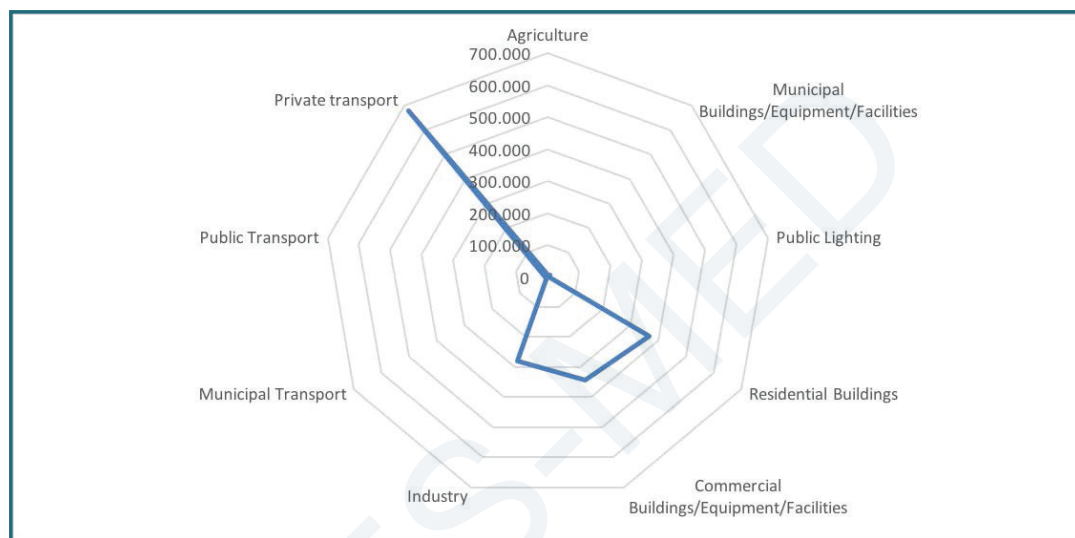


Figure 1 - Ramla energy consumption per sector

The **Agricultural Sector** has a very small consumption of electricity according to data provided by the IEC.

The Municipal Buildings and Facilities Sector includes consumptions from the municipal offices, the educational buildings, cultural buildings and facilities and the water pumping facilities. The most consuming sector is the educational buildings, followed by the water pumping facilities, as shown in the figure below.

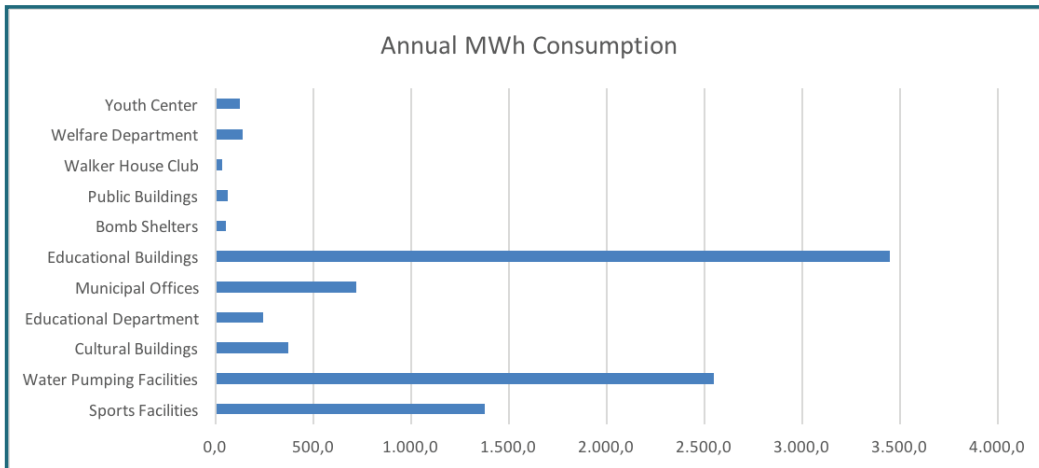


Figure 2 - Annual Electricity Consumption of Municipal Buildings / Equipment / Facilities (MWh)

As far as the **Municipal Lighting Sector** is concerned, the consumption occurs from the public street lights, the traffic lights and the municipal parking lots. The total electricity consumption was provided by IEC.

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 provided by 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:

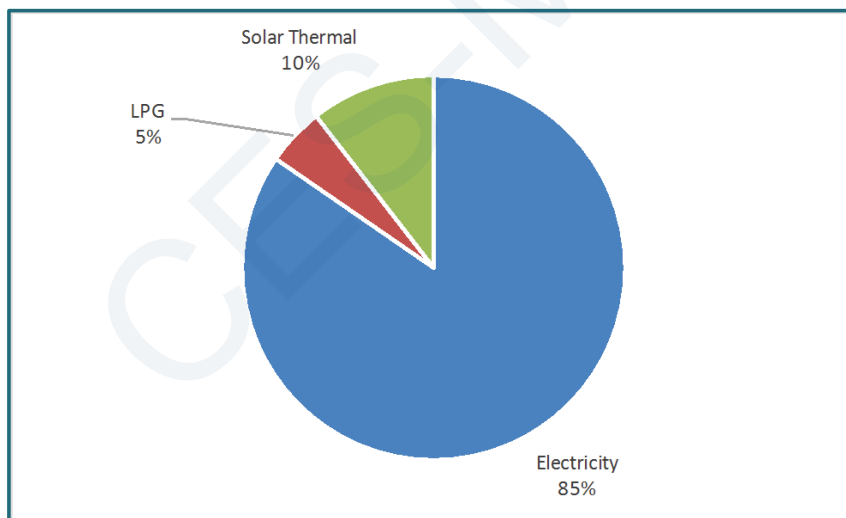


Figure 3- Energy source allocation in the Residential Buildings Sector

The **Commercial Buildings, Equipment and Facilities Sector** consumes electricity from the IEC and includes data from the Commercial sector buildings and facilities and from the local prison. The local prison's consumption is deducted from the total and it is not included in the baseline emissions inventory.

The **Industrial Sector** includes electricity consumptions from the industries that operate in the area of Ramla. There are two industrial zones, one with light industrial consumers and commercial stores and the second with the heavy industries, which produce cement or galvanise metal.

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

- The **municipal fleet** of Ramla includes passenger vehicles, commercial vehicles and trucks, whose consumption data were available from the Municipality.
- 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, gasoline and diesel trucks, private buses and minibuses. The approach utilized was based on the average distance that each vehicle type covers within a year, which was available from the Israeli CBS for the year 2011 and relevant studies by the Technion University on the amounts of the distances that are travelled within the local authorities' area.

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

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 Municipality of Ramla. The amount of waste that is recycled was almost 17% in total for 2011, while the rest is landfilled.

The **total emissions for the Ramla Municipality** are presented in the table below.

Table 1 - Baseline Emission Inventory Summary (tn CO₂)

| Sector of energy consumption | Electricity | Liquid Gas | Diesel | Gasoline | Solar Thermal | TOTAL |
|---|--------------------|-----------------|-------------------|------------------|---------------|-------------------|
| | tn CO ₂ | | | | | |
| Agriculture | 5,057.70 | - | - | - | - | 5,057.70 |
| Municipal Buildings/Equipment/Facilities | 6,698.18 | - | - | - | - | 6,698.18 |
| Public Lighting | 3,952.96 | - | - | - | - | 3,952.96 |
| Residential Buildings | 231,004.95 | 4,152.92 | - | - | 0.00 | 235,157.87 |
| Commercial Buildings/Equipment/Facilities | 251,961.00 | - | - | - | - | 251,961.00 |
| Industry | 204,800.20 | - | - | - | - | 204,800.20 |
| Municipal Transport | - | - | 94.75 | 145.71 | - | 240.47 |
| Public Transport | - | - | 2,295.06 | - | - | 2,295.06 |
| Private transport | - | - | 101,946.94 | 74,077.69 | - | 176,024.63 |
| Solid Waste Management | - | - | - | - | - | 26,765.00 |
| TOTAL | 703,474.99 | 4,152.92 | 104,336.76 | 74,223.40 | 0.00 | 912,953.07 |

The municipality's representatives, through the BEI identification, acknowledged the most significant sectors affecting their carbon footprint. The Commercial sector is the most consuming sector, with Residential and Industrial sectors following. The private transport sector is also important because of its energy consumption and relevant CO₂ emissions.

According to the Baseline Emissions Inventory and the JRC Guidelines for the Southern Municipalities, the projection of the emissions for 2020 in the Municipality of Ramla was made with the **Business as Usual (BAU)** scenario.

For the Municipality of Ramla, the total emissions for the baseline year (2011) were 912,953.07 tn CO₂ and the national coefficient k for 2011 in Israel is 1.27. Therefore, the forecasted emissions for 2020 are

$$Emissions_{CO_2}^{2020} = 912,953.07 \times 1.27 = 1,159,450.40 \text{ tnCO}_2$$

The actual reduction target undertaken by the municipality fulfils the CoM requirements and is set to 20%, corresponding to an overall reduction of 231,954.27 tn CO₂ by 2020. The emissions reduction targets are different for each sector included in the BEI. Each sectors contribution is presented in the pie chart below.

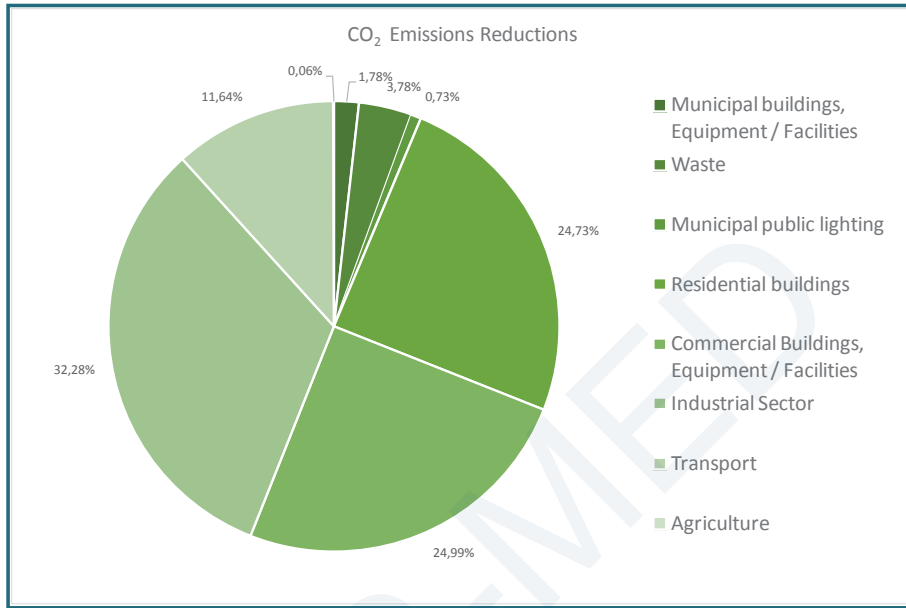


Figure 4 - Contribution per sector to the total CO₂ emission reduction

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

Table 2 - Ramla Municipality Actions Overview

| 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 | 177.88 | 106.73 | 200,000.00 |
| 1.2 | Upgrade of the municipal buildings' and facilities' lighting system | 301.21 | 180.72 | 750,000.00 |
| 1.3 | LED lighting in new municipal projects | 87.85 | 52.71 | 200,000.00 |
| 1.4 | Upgrade of the municipal buildings' and facilities' A/C systems | 1,255.00 | 753.00 | 4,000,000.00 |
| 1.5 | Installation of automations in municipal buildings and facilities | 836.68 | 502.00 | 500,000.00 |
| 1.6 | Energy Manager appointment in the Municipality | 58.03 | 34.82 | 500,000.00 |
| 1.7 | Awareness raising activities for municipal employees | 19.87 | 11.92 | 50,000.00 |
| 1.8 | Shadings' installation in the municipal buildings' southern façade | 627.51 | 376.51 | 1,500,000.00 |
| 1.9 | The 10% commitment campaign for schools | 394.30 | 236.58 | 100,000.00 |
| 1.10 | Awareness raising campaigns for pupils/ students | 87.62 | 52.57 | 40,000.00 |
| 1.11 | Increase of natural lighting in municipal buildings | 62.75 | 37.65 | 300,000.00 |
| 1.12 | Use of cool colours on municipal buildings and facilities' roofs | 502.00 | 301.21 | 300,000.00 |
| 1.13 | Promotion of recycling | | 6,798.31 | 3,000,000.00 |
| 1.14 | Awareness raising campaigns to reduce the amounts of discarded food (reduction of the organic content of waste) | | 2,039.49 | 150,000.00 |
| 1.15 | Installation of 2 MW PVs in municipal buildings' rooftops | 2,400.00 | 1,440.00 | 10,000,000.00 |

| Action No | Action | Energy Savings (MWh) | Emission Reductions (tn CO ₂) | Cost (NIS) |
|---|---|----------------------|---|-----------------------|
| 1.16 | Construction of a municipal green building as demonstration project | 167.34 | 100.40 | 1,500,000.00 |
| Municipal public lighting | | | | |
| 2.1 | Municipal lighting study | 0.00 | 0.00 | 100,000.00 |
| 2.2 | Municipal lighting system upgrade | 2,674.92 | 1,604.95 | 4,000,000.00 |
| 2.3 | Solar street lighting signs | 50.00 | 30.00 | 200,000.00 |
| 2.4 | Upgrading traffic lights | 106.82 | 64.09 | 300,000.00 |
| Residential buildings | | | | |
| 3.1 | The 10% voluntary commitment campaign | 36,021.65 | 21,613.00 | 450,000.00 |
| 3.2 | Promotion of Green Buildings' concept | 9,454.50 | 5,672.70 | 200,000.00 |
| 3.3 | Campaign for substitution of old fridges, ACs and lamps | 10,862.50 | 6,517.50 | 12,000,000.00 |
| 3.4 | Information & awareness raising activities | 12,007.22 | 7,204.33 | 150,000.00 |
| 3.5 | Initiatives supporting citizens' actions | 4,002.41 | 2,401.44 | 100,000.00 |
| 3.6 | Establishment of the municipal team | 6,003.61 | 3,602.16 | 1,400,000.00 |
| 3.7 | 6 MW Photovoltaics in residential rooftops | 7,200.00 | 4,320.00 | 50,500,000.00 |
| 3.8 | Voluntary agreement with Building Constructors to promote green building concepts | 3,403.62 | 2,042.17 | 50,030,000.00 |
| 3.9 | Awareness raising activities for the residential buildings' associations | 4,447.12 | 2,668.27 | 150,000.00 |
| Commercial Buildings, Equipment / Facilities | | | | |
| 4.1 | Seminars to professional groups | 8,730.99 | 5,238.60 | 500,000.00 |
| 4.2 | On-going training to professional groups | 21,827.48 | 13,096.49 | 450,000.00 |
| 4.3 | 10% voluntary commitment campaign | 26,192.98 | 15,715.79 | 550,000.00 |
| 4.4 | Promotion of green buildings' concept | 15,279.24 | 9,167.54 | 200,000.00 |
| 4.5 | Other information and awareness raising activities | 10,913.74 | 6,548.24 | 100,000.00 |
| 4.6 | 12 MW photovoltaics on building rooftops | 14,400.00 | 8,640.00 | 100,100,000.00 |
| Industrial Sector | | | | |
| 5.1 | Subsidized energy audits at a volunteer basis | 26,612.85 | 15,967.71 | 750,000.00 |
| 5.2 | Targeted training seminars | 12,419.33 | 7,451.60 | 350,000.00 |
| 5.3 | 10% voluntary commitment campaign | 24,838.66 | 14,903.20 | 80,000.00 |
| 5.4 | On-going training provision | 17,741.90 | 10,645.14 | 250,000.00 |
| 5.5 | Switch to a "cleaner" electricity provider | 70,967.60 | 26,470.91 | 0.00 |
| Transport | | | | |
| 6.1 | Replacement of the municipal vehicles with new and more efficient | 82.78 | 21.10 | 5,500,000.00 |
| 6.2 | Efficient management of the municipal fleet | 23.88 | 6.11 | 50,000.00 |
| 6.3 | Maintenance of the municipal fleet | 77.60 | 19.85 | 220,000.00 |
| 6.4 | Eco-driving seminars for the municipal fleet's drivers | 119.39 | 30.54 | 50,000.00 |
| 6.5 | Awareness raising on new vehicle technologies | 34,509.68 | 8,942.05 | 185,500,000.00 |
| 6.6 | Transportation master plan | 0.00 | 0.00 | 550,000.00 |
| 6.7 | Improve public transportation | 16,548.88 | 4,120.67 | 50,000.00 |
| 6.8 | Cycling promotion and creation of related infrastructure | 6,875.37 | 500.00 (2020) 1,717.00 (2030) | 10,750,000.00 |
| 6.9 | Promotion of walking, car sharing and car pooling campaigns | 11,032.59 | 2,747.11 | 2,000,000.00 |
| 6.10 | Improvement / development of parking infrastructure | 12,411.66 | 3,090.50 | 12,000,000.00 |
| 6.11 | Adoption of real time information in public transport | 4,137.22 | 1,030.17 | 450,000.00 |
| 6.12 | Promotion of eco-driving | 8,797.48 | 2,322.81 | 550,000.00 |
| 6.13 | Promotion of new technology buses in the public transportation | 3,977.22 | 1,061.92 | 189,000,000.00 |
| 6.14 | Traffic congestion reduction through adoption of different timing of activities | 30,619.84 | 3,299.23 | 500,000.00 |
| Agriculture | | | | |
| 7.1 | Awareness raising activities | 252.89 | 151.73 | 50,000.00 |
| TOTAL | | 482,623,67 | 231,954,27 | 653,220,000.00 |

Chapter 1 : Overall Strategy

1.1 Ramla 2020 Targets

Israel has been many times characterized 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 Mayor of Ramla, 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 has also signed the Israeli Initiative Tag HaSviva and has been selected from the CES-MED EU programme to have its SEAP funded, due to the Mayor's commitment on energy sustainability with the CoM signature.

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

Ramla is a city in the inner coastal area of Israel, at a distance of 17 km from Tel-Aviv and around 40 km from Jerusalem, covering a total geographical area of 10 km². Its location in the centre of Israel justifies its coronation as the capital of the Centre District in Israel.

A map of the territory is provided on the following figure.



Figure 5 - Ramla Municipality

The town was established in the beginning of the 8th century.

The city, as the other parts of Israel, has a long history for centuries with different conquerors over the years. In the 8th century Ramla was conquered by Sliman Ibn Abed El Malek, who later became the Khalif, and consequently Ramla became the capital city in the Arab Era. The name City of Ramla is translated to the city of sand, because the city was built on sand dunes.

Since it was established in the 8th century, Ramla was one of the biggest and most important cities in the country. In Arabic it was also referred to as the "giant city", and was then the politic and economic centre. For this reason, it was occupied many times by the different rulers who wanted to conquer the area. In addition, over the years it has suffered several earthquakes, as it is located in a geological sensitive tectonic area. The last earthquake has been in 1927.

The historical and tourist attractions in the Municipality of Ramla are:

- The **Tower of Ramla, also known as the White Tower**, was built in the 13th century. It served as the minaret of the White Mosque (*al-Masjid al-Abyad*) erected by Caliph Suleiman in the 8th century, of which only remnants remain today.
- The **Hostel of St. Nicodemus and St. Joseph of Arimathea** on the main boulevard, Herzl Street, is easily recognized by its clock-faced, square tower. It belongs to the Franciscan church. In 1902 a church, a monastery and a school were built on the ruins of the hostel, by the Franciscan church - The Terra Santa.
- A **150 m stretch of water aqueduct** was discovered during 2001, while making road constructions. It is 40-55 cm. wide, U shaped, and has a height of 120 cm. It is believed to have been built around the 10th century, for bringing fresh water to the city – especially in war times when the city was under siege.
- The **Ramla Museum** is housed in the former municipal headquarters of the British Mandatory authorities. The building is from 1922 and integrates elements of Arab architecture, such as arched windows and patterned tiled floors. After 1948, it was the central district office of the Israeli Ministry of Finance. In 2001, the building became a museum documenting the history of Ramla. The permanent exhibition includes archeological findings of Ramla from the Middle Ages, a coin collection including coins from the 8th until the 11th centuries. In addition, there is a modern history room from the independence of the state of Israel, a tent from those days, and a room showing the plans for the development of the city. On the first floor there is a memorial for the fallen soldiers at war.
- The **Pool of Arches** is an underground water cistern, also known as St. Helen's Pool, which was built during the reign of the caliph Haroun al-Rashid in 789 AD (the early Islamic period) to provide Ramla with a steady supply of water. The pool is a unique structure: it is about half a Dunam, with a ceiling height of 9 meters. Its depth is roughly 1 meter with a volume of 5,700 m³. The roof is supported by three rows of columns, between each pair a supporting arch.
- **Ramla Commonwealth War Graves Commission cemetery** is the largest Commonwealth war cemetery in Israel. 5,731 British soldiers who lost their lives in the first and second world wars as well as the British Mandate are buried in the cemetery.
- **The Big Mosque** lies in a structure that was originally used as a crusaders cathedral and was built in the mid-12th century. Some refer to it as the church of John the Holy, although a church with this name is not mentioned in the crusaders certificates. In 1260 the church was seized by the Muslims and converted into a Mosque, next to it a Minaret was built. Today it is the largest crusade church remaining in Israel in its original planning.
- **Monastery of Holy Georgiou the Greek** is serving the Orthodox community, which is the biggest of the Christian communities in Ramla. Its foundations are from the 12th century, with a church built in the 19th century. Over the large entrance door is a scene with the Sacred Georgiou riding a horse and slaying a dragon.
- The **Ramla Market** was first established at the end of the Othman (Turkish) period and has existed for over 100 years. It is a very famous colorful market with fruits, vegetables, herbs,

spices, cloths and more, together with food stands and small restaurants. In the last few years, the market has been fitted with a ceiling and upgrades were made on the infrastructure.

Pictures from the above sites are presented in the figure below.



Figure 6 – Historical and tourist attractions in the city of Ramla

1.2.2 Demographic tendencies

After the 1948 UN resolution of the independence of the state of Israel, Ramla became one of the centres of conflict. After some months of military feuds, the Arab population fled the town, and the city became Jewish. Some months later, some of the families came back and since then Ramla is a mixed population city. In the early 1990s, with the fall of the former U.S.S.R., many new Jewish people came to Israel and Ramla accommodated a vast majority of these immigrants.

Today, Ramla is one of the few towns in Israel that has mixed population with Jewish and Arab citizens. According to data from 2011 there is a population of 68,000, of which 73% is Jewish, 18% is Arab-Muslims, 5% others. The average income is about 75% of the national one. Ramla has many immigrants, and the citizens are from a number of countries; about a third of the citizens are from the former Soviet Union, who migrated to the country around the 1990's.

1.2.3 Climate characteristics

The topography is almost flat, with ground rich with minerals that come with the many small streams, which flow in the area and collect in the Ayalon and in the Sorek rivers.

The temperatures are pleasant, with relatively small differences between minimum and maximum. The average in the coldest day of the year is 13°C in January, while the average temperature of the warmest month is 27°C in August. In the summer, there is medium heat load with average humidity of 65%. The average rainfall is 530-570 mm per year (only in the winter), in addition the yearly dew is 100 mm.

Table 3 –Ramla Municipality Temperatures

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | 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 average | 13.0 | 13.5 | 15.6 | 18.7 | 21.7 | 24.6 | 26.9 | 27.3 | 25.9 | 23.0 | 18.8 | 15.0 |

The following figure presents the maximum daily average (Red), minimum daily average (Blue) and Daily average (Green). 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).

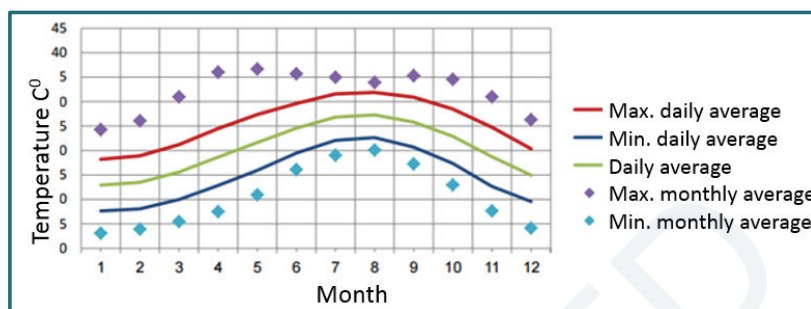


Figure 7 – Ramla Municipality Temperatures

1.2.4 Employment

The total number of employees (salary and self-employed) according to CBS data for 2012 was 29,295 persons, namely a little over 43% of the total population. About 40% of these employees earn less than the minimum wage, with the discrepancies between men and women being vast. The Socio-Economic rating is medium: 4 (on a scale from 1-10, 1 being the lowest).

1.2.5 Existing Infrastructure

The total number of registered households is 19,176, most of them privately owned; currently there is a total of 764 buildings being built and another 304 near completion. Houses are a mixture of low and high raised buildings, including 1-2 stories family cottages in some neighbourhoods. Because of land scarcity, plans for new neighbourhoods follow a modern fashion with relatively high raised apartment buildings up to 40 stories high.

1.2.6 Complementarity with municipal plans and other related actions

The Municipality of Ramla has joined and implemented several projects that are complementary to the Covenant of Mayors initiative.

The **solar street signs programme**, which started as a pilot from the Electricity Department of the Municipality, resulted in the installation of about 80 solar lighting poles in the local authority area. The pilot project has stopped up to the time this SEAP is composed, but it is the intention of the municipality to continue the project during the SEAP actions implementation period.



Figure 8 –Solar lighting post in Ramla

Furthermore, several awareness-raising actions have been implemented in the past, with the Municipal website playing an important role in the knowledge dissemination. Social media tools of Ramla Municipality have also been used to promote the “You saved, you gained” campaign, while the following poster has been published.



Figure 9 - "You saved, you gained" poster

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, local authorities, 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 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 aims to promote streamlining processes and save resources while achieving economic gain for the local authorities (LAs) 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.

Although the municipality of Ramla is involved in energy efficiency projects for some years, it has not realized an integrated citizens' awareness plan. Therefore, there is a need for significant action, with high visibility that will include all key stakeholders and groups in the community. The action will create a vast impact, bringing the issue of energy efficiency, energy savings and renewable energy to the centre of attention.

1.3 Vision for the future

The Municipality of Ramla gives the citizens a high quality and diverse service level, in addition to education, culture, social events and sports activities. Every year millions of Shekels (NIS) are invested to promote and develop the city, to build infrastructure and new neighbourhoods, to upgrade public buildings, to develop new green areas, gardens and parks and to create a vibrant community and cultural life.

The top priority for the municipality is investing in education. The schoolchildren enjoy a high quality innovative school and education system that opens the window of opportunity for equality and success for each and every child. Another important factor for the municipality is the continuous education and the behavioural change of its citizens, in order the city to become "greener" and consume less energy.

As the mayor states: *"It is our responsibility towards the planet, the state of Israel and of course for the benefit of our citizens. We shall continue improving our city to be clean, healthy, and safe, with the highest quality of life and environment for our citizens. We shall develop the necessary infrastructure; have bicycle lanes, public transportation, energy efficient homes, offices and buildings, cleaner air, more green jobs. Our joining the CoM and the CES-MED project will help us realize our joint goals."*

1.4 Organizational and financial aspects

1.4.1 Coordination with national and local authorities

During the SEAP implementation, the Municipality of Ramla 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 Ramla implemented 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 Ramla is presented in Figure 10. The green section is mainly the "Engineering wing" of the Municipality, which will play an important role in the completion of the SEAP targets with both resources and manpower, along with other sections and representatives of the Municipality. It should be noted that three persons have the most significant engagement for the SEAP's implementation:

- Ms. Sharon Etner – Head of Maintenance and appearance wing (SH.F.A)
- Mr. Barak Yekutiel – responsible for hazardous material and clean air, in the above wing (SH.F.A)
- Mr. Alon Shemesh – head of Electricity department, under the Engineering wing

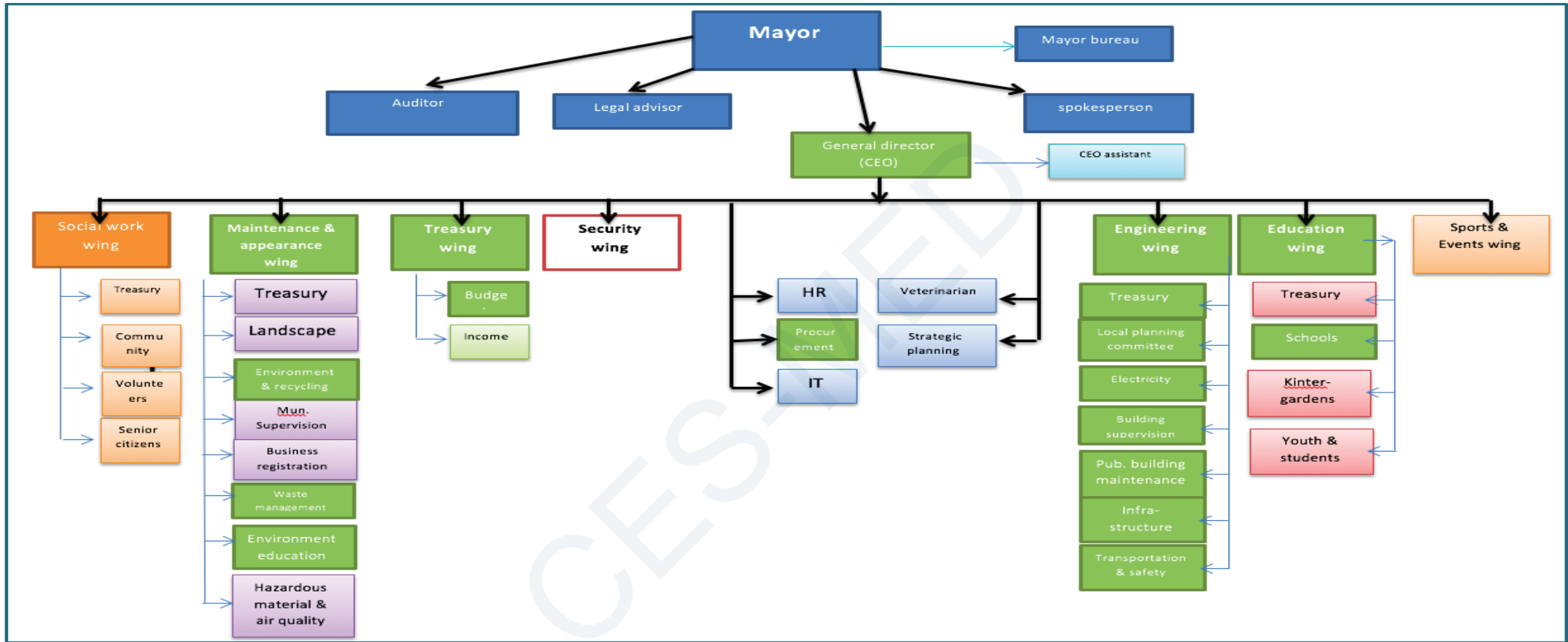


Figure 10 - Municipality of Ramla Organogram

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, the existence of large-scale industrial consumers indicates the need to achieve a high level cooperation with their representatives, in order to achieve an important reduction in emissions from the industrial sector.

Moreover, in all schools several programs for GHG emission reduction shall be incorporated. The Ministry of Energy 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' budgets come from two main sources. The first source 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 Municipality of Ramla.

The municipal annual budget is 460 Mil. NIS (102 Mil Euro). Out of this, about 33% is governmental budget.

For the implementation of the SEAP the total budget is 653.22 million NIS, including the mobilization of the necessary funds from private actors. The budget excluding the funds from private actors is 70.42 million NIS and the Municipality of Ramla will contribute to this with around 10%.

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 mobilised 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 yearly 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 Ramla 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 that were used, wherever applicable, were according to the JRC guidelines 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 Ramla, and all the conversion rates used in the BEI are explained in the table below.

Table 4 - Emission Factors (tn CO₂ / MWh) and Conversion Rates Used in the BEI

| Energy Source | Emission Factor (tn CO ₂ / MWh) | Conversion Rates Used |
|---------------|--|--|
| Electricity | 0.733 | - |
| Liquid Gas | 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 (CH₄) emissions that are produced from the landfilling process and then it was considered that each ton of CH₄ produced equals to 25 tons of CO₂ 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 division of the electricity consumptions, as well as **solid waste treatment**.

Especially, concerning the industrial sector, it should be noted that there is heavy industry in the area of Ramla, in particular Neshor cement company (the biggest in Israel), the consumptions of which however have been excluded from the sector. The remaining are mainly small industries, in their majority high-tech companies producing software industrial products, classified as industries by the IEC.

2.2 Energy Consumption

The total energy consumption in the Municipality of Ramla 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 Ramla

| Sector of energy consumption | Electricity | Liquid Gas | Diesel | Gasoline | Solar Thermal |
|---|-------------------|------------------|-------------------|-------------------|------------------|
| | MWh | | | | |
| Agriculture | 6,900.00 | - | - | - | - |
| Municipal Buildings/Equipment/Facilities | 9,138.04 | - | - | - | - |
| Public Lighting | 5,392.85 | - | - | - | - |
| Residential Buildings | 315,150.00 | 18,294.82 | - | - | 35,036.40 |
| Commercial Buildings/Equipment/Facilities | 343,739.83 | - | - | - | - |
| Industry | 279,400.00 | - | - | - | - |
| Municipal Transport | - | - | 354.88 | 585.19 | - |
| Public Transport | - | - | 8,595.74 | - | - |
| Private transport | - | - | 381,823.75 | 297,500.75 | - |
| TOTAL | 959,720.72 | 18,294.82 | 390,774.37 | 298,085.94 | 35,036.40 |

The total amount of energy that is consumed in the Municipality of Ramla is **1,701,912.25 MWh**.

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

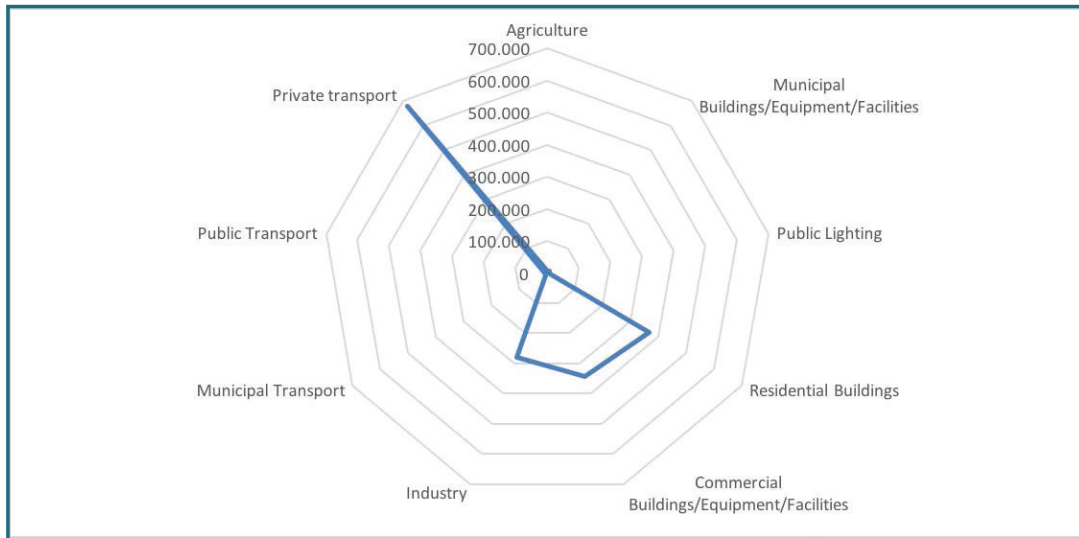


Figure 11 - Energy Consumption per sector

2.2.1 Agricultural Sector

The Municipality of Ramla, according to the Israeli Electricity Company (IEC) data, has an annual consumption of 6,900,000 kWh of electricity of the year of 2011.

Table 6 – Agricultural Sector Energy Consumption

| Consumer | Electricity (MWh) | Emission Factor | CO ₂ Emissions (tn) |
|-------------|-------------------|-----------------|--------------------------------|
| Agriculture | 6,900 | 0.733 tn/MWh | 5,058 |

2.2.2 Municipal Buildings, Equipment / Facilities

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

- Cultural buildings;
- Educational department;
- Municipal offices;
- Educational buildings;
- Bomb shelters;
- Public buildings;
- Walker House club;
- Welfare department;
- Youth centre.

As far as the municipal facilities, these include:

- Sports facilities;
- Water pumping 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, the electricity consumptions of each subcategory in the sector are being recorded, according to the IEC data the Municipality has available.

Table 7 - Municipal Buildings/Equipment/Facilities Electricity Consumption

| Agriculture | Agriculture | Agriculture | Agriculture |
|--------------------------|-----------------|--------------|-----------------|
| Sports Facilities | 1,376.7 | 0.733 tn/MWh | 1,009.12 |
| Water Pumping Facilities | 2,550.0 | | 1,869.15 |
| Cultural Buildings | 374.4 | | 274.45 |
| Educational Department | 246.5 | | 180.69 |
| Municipal Offices | 719.3 | | 527.27 |
| Educational Buildings | 3,449.7 | | 2,528.63 |
| Bomb Shelters | 53,2 | | 38.97 |
| Public Buildings | 62,9 | | 46.12 |
| Walker House Club | 37,2 | | 27.29 |
| Welfare Department | 141,3 | | 103.57 |
| Youth Centre | 126,8 | | 92.94 |
| TOTAL | 9,138.04 | | 6,698.18 |

Figure 12 shows the allocation of the total consumption per sector of the Municipal Buildings, Equipment/Facilities, with the educational buildings being the most consuming category, with just below 38% of the total electricity used.

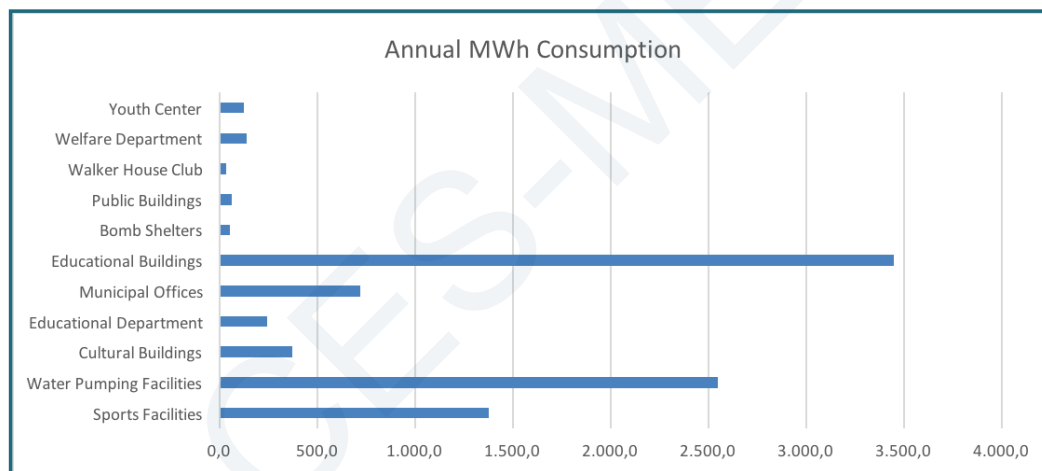


Figure 12 - Annual Electricity Consumption of Municipal Buildings / Equipment / Facilities (MWh)

Especially on the educational buildings already reported above, 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. Ramla Municipality has seven (7) High schools, three (3) Middle Schools, sixteen (16) Elementary Schools and fifty-four (54) Preschools. The following pie chart (Figure 13) shows the percentage of consumption for each educational sector.

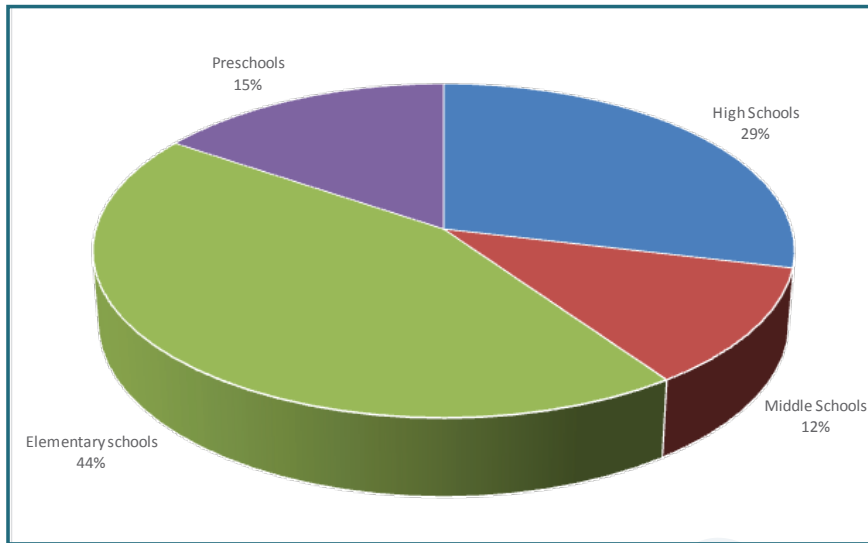


Figure 13 - Contribution of each educational level in Educational Buildings' consumption

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

Table 8 - Available data for electricity consumptions per Education Level

| Education Level | Annual Energy Consumption (kWh) |
|--------------------|---------------------------------|
| High Schools | 990,254 |
| Middle Schools | 400,002 |
| Elementary schools | 1,523,697 |
| Preschools | 535,749 |
| TOTAL | 3,449,702 |

2.2.3 Municipal Public Lighting

As far as the public lighting sector is concerned, there are three types in the Municipality of Ramla. The main consumption comes from the street lighting, while the rest of it belongs to traffic lights and parking lot lights. 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 | 5.265,60 | 0,733 tn/MWh | 3.859,69 |
| Traffic lights | 112,15 | | 82,20 |
| Parking Lot Lights | 15,10 | | 11,07 |
| TOTAL | 5.392,85 | | 3.952,96 |

The majority of the electric consumption refers to the street lighting (98%), whereas traffic lights have a very small impact (2%) in the overall consumption, and the parking lot lights almost none, as shown in the following pie chart.

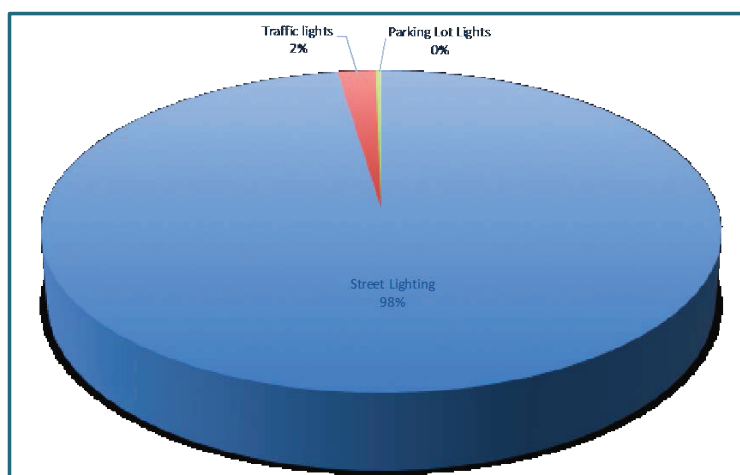


Figure 14 - Contribution of each Street Lighting sector in total consumption

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 being dedicated to cooking gas.

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

Table 10 - Electricity Consumption in Residential Sector

| Consumer | Electricity (MWh) | Emission Factor | CO ₂ Emissions (tn) |
|--------------------|-------------------|-----------------|--------------------------------|
| Residential sector | 315,150 | 0,733 tn/MWh | 231,004.95 |

Liquefied Petroleum Gas

Except from electricity, there is a small usage of cooking gas from the households of the Municipality of Ramla. 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 m³ monthly, or 36 m³ annually. With the number of households being 17,500 according to municipal records, the calculations of the following table are made. The conversion from m³ to kWh was realized using LPG density in gas form (2.21 kg/m³) 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 | 18,294.82 | 0.227 tn/MWh | 4,152.92 |

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 m² of Solar Water Heaters. The 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 Ramla is 1,845 kWh/m² and the average solar panel is 2.5 m².

The calculations are according to the following mathematical formula:

$$\begin{aligned} \text{Annual output per person} &= \text{average efficiency} * \text{SHWH per person} * \text{average solar energy} \\ &= 0.50 * 0.56 * 1,845 = 516 \text{ kWh} \end{aligned}$$

And for the Ramla population of 67.900 the result is:

$$\begin{aligned} \text{Annual City output} &= \text{population} * \text{annual output per person} \\ &= 67,900 * 0.516 = 35,036.4 \text{ MWh.} \end{aligned}$$

The corresponding emissions saved from the SHWH is 25,681.68 tn CO₂.

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 | 315,150.00 |
| LPG | 18,294.82 |
| Solar Thermal | 35,036.40 |
| TOTAL | 368,481.22 |

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

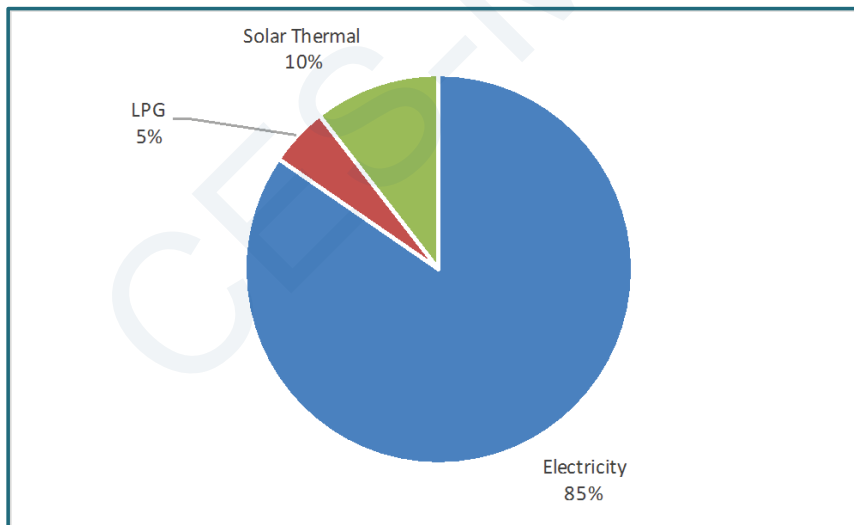


Figure 15- Energy Sources in the Residential Sector

2.2.5 Commercial Buildings, Equipment / Facilities

Data from the IEC for 2011 were gathered for the total electricity consumption of the tertiary sector. The data available from the IEC mentioned a total consumption of 360,669,110 kWh, which according to the Municipality of Ramla included a prison that is located in the municipal area. The total consumption of the prison facilities is 16,929,280 kWh for 2011, and is being deducted from the rest

of the sector's consumption. So the final electricity consumption of the commercial buildings is presented in Table 13.

Table 13 - Consumptions for Commercial Buildings / Equipment / Facilities

| Consumption Category | Electricity (MWh) | Emission Factor | CO ₂ Emissions (tn) |
|----------------------|-------------------|-----------------|--------------------------------|
| Commercial Buildings | 343,739.83 | 0.733 tn/MWh | 251,961 |

2.2.6 Industrial Sector

The industrial sector data are provided by the IEC and refer to the annual consumption of electricity in the local industries. As mentioned before, the heavy industry available in the area of Ramla is Neshor cement company. Data for the cement company was obtained through the municipality by the company itself, and it was higher from the consumptions reported under the sector by IEC. Therefore, it was not included in the sector's consumptions from the beginning.

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

Table 14 - Industrial sector consumption

| Consumer | Electricity (MWh) | Emission Factor | CO ₂ Emissions (tn) |
|------------|-------------------|-----------------|--------------------------------|
| Industrial | 279,400.00 | 0.733 tn/MWh | 204,800 |

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 Ramla, according to the accountant's office. There are three types of vehicles that the municipality uses, commercial vehicles, passenger vehicles and trucks, which consume either Gasoline 95, or Diesel. The data gathered is presented in detail in ANNEX B.

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

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 | 15,762 | 157.62 | 42.08 | 63,608 | 585.19 | 145.71 |
| Commercial Vehicles | 16,409 | 164.09 | 43.81 | 0 | 0 | 0 |
| Trucks | 3,317 | 33.17 | 8.86 | 0 | 0 | 0 |
| TOTAL | 35,488 | 354.88 | 94.75 | 63,608 | 585.19 | 145.71 |

The following pie chart shows that Gasoline is the most used fuel type in the Municipal fleet, while Diesel covers 36% of the total energy needed.

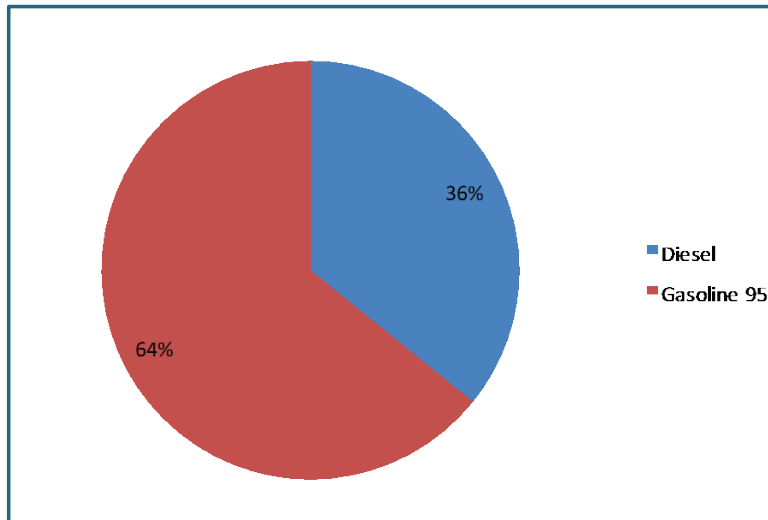


Figure 16 - Municipal Fleet Fuel Consumption

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 57 bus lines in Ramla, each with a different number of routes per year and different distance travelled. The data provided by the Municipality of Ramla and used to calculate the final energy consumption of this sector is available in ANNEX C.

The average consumption of the public buses at national level for the year 2011 was according to CBS 51.16 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) |
|-----------------------------------|--------------------|--------------|-----------------|--------------------------------|
| 1,680,075 | 859,574.42 lt | 8,595.74 MWh | 0.267 tn/MWh | 2,295.06 |

2.2.7.3 Private and Commercial Transport

Regarding private transportation, the number of vehicles registered at the area of Ramla is available from the Municipal Records. Based on the CBS publication concerning the average distance each vehicle type covers, and estimations for the distance within the local area of Ramla and average consumptions per vehicle type, the total energy consumption is calculated. The consumption related data 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 car | 15,511 | 17,100 | 183,014.29 | 0.249 | 45,570.56 |
| Motorcycle | 439 | 7,600 | 982.24 | 0.249 | 244.58 |
| Taxi | 275 | 81,600 | 20,644.80 | 0.267 | 5,512.16 |
| Gasoline Truck | 2,313 | 15,400 | 104,865.87 | 0.249 | 26,111.60 |
| Diesel Truck | 1,886 | 30,900 | 262,248.30 | 0.267 | 70,020.30 |
| Bus | 325 | 59,500 | 98,930.65 | 0.267 | 26,414.48 |
| Minibus | 207 | 50,400 | 8,638.36 | 0.249 | 2,150.95 |
| TOTAL | 20,956 | | 679,324.50 | | 176,024.63 |

All the assumptions 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. A study on the commuting patterns in Israel shows that the in going and out going patterns for Ramla are the same, meaning that the number of people that commute outside the municipality, is the same with that commuting towards the municipality. For this reason and due to lack of any other studies available, it was considered than 100% of the distance travelled by the registered vehicles is realized within municipal borders.

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 cars | 17,100 | 100% | 7.5 | Gasoline 95 |
| Motorcycles | 7,600 | 100% | 3.2 | Gasoline 95 |
| Taxi | 81,600 | 100% | 9.2 | Diesel |
| Gasoline Truck | 15,400 | 100% | 32 | Gasoline 95 |
| Diesel Truck | 30,900 | 100% | 45 | Diesel |
| Buses | 59,500 | 100% | 51.16 | Diesel |
| Minibus | 50,400 | 100% | 9 | Gasoline 95 |

2.2.8 Final Energy Consumption

In Table 19 all the energy consumptions within Municipality of Ramla are presented, totalling **1,701.91 GWh**.

Table 19 - Total Energy Consumption

| Category | FINAL ENERGY CONSUMPTION [MWh] | | | | | | | | | | | | | | | Total | |
|--|--------------------------------|-------------|--------------|------------------|-------------|-------------------|-------------------|-------------|-------------|--------------------|--------------------|-------------|---------------|------------------|-------------|-------------|---------------------|
| | Electricity | Heat /cold | Fossil fuels | | | | | | | | Renewable energies | | | | | | |
| | | | 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 | 9.138,04 | | | | | | | | | | | | | | | | 9.138,04 |
| Tertiary (non municipal) buildings, equipment/facilities | 343.739,83 | | | | | | | | | | | | | | | | 343.739,83 |
| Residential buildings | 315.150,00 | | | 18.294,82 | | | | | | | | | | 35.036,40 | | | 368.481,22 |
| Public lighting | 5.392,85 | | | | | | | | | | | | | | | | 5.392,85 |
| Industry | Non-ETS | 279.400,00 | | | | | | | | | | | | | | | 279.400,00 |
| | ETS | | | | | | | | | | | | | | | | 0,00 |
| | Total | 279.400,00 | | | | | | | | | | | | | | | 279.400,00 |
| Subtotal | 952.820,72 | 0,00 | 0,00 | 18.294,82 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 35.036,40 | 0,00 | 0,00 | 1.006.151,94 |
| TRANSPORT: | | | | | | | | | | | | | | | | | |
| Municipal fleet | | | | | | 354,88 | 585,19 | | | | | | | | | | 940,07 |
| Public transport | | | | | | 8.595,74 | | | | | | | | | | | 8.595,74 |
| Private and commercial transport | | | | | | 381.823,75 | 297.500,75 | | | | | | | | | | 679.324,50 |
| Subtotal | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 390.774,37 | 298.085,94 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 688.860,31 |
| OTHER: | | | | | | | | | | | | | | | | | |
| Agriculture, forestry, fisheries | 6.900,00 | | | | | | | | | | | | | | | | 6.900,00 |
| TOTAL | 959.720,72 | 0,00 | 0,00 | 18.294,82 | 0,00 | 390.774,37 | 298.085,94 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 35.036,40 | 0,00 | 0,00 | 1.701.912,25 |

2.3 Local Electricity Production

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

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 Ramla.

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 bioma ss | 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 Ramla 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 going to recycling that is not included in the overall recycling rate. The data available from the Municipality of Ramla is displayed in Table 22.

Table 22 - Waste and Recycling quantities per type of waste

| Type | Amount of Waste Collected (ton/yr) |
|---|------------------------------------|
| Garbage (not including yard trimmings) | 31,496 |
| Yard Waste | 2,461 |
| Waste to recycling | |
| White Paper and Newspaper | 304 |
| Cardboard | 1,320 |
| Glass | 527 |
| Metal | 207 |
| Plastic | 98 |
| Organic Waste | 5,307 |
| Total Recycling | 7,763 |
| Yard Waste for recycling not included in the overall recycling rate | 3,877 |
| Total Collected Waste (Garbage+Recycling+Yard Waste) | 45,597 |

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.

$$\text{Methane emissions (Gg/yr)} = (\text{MSW}_T \bullet \text{MSW}_F \bullet \text{MCF} \bullet \text{DOC} \bullet \text{DOCF} \bullet F \bullet 16/12 - R) \bullet (1 - \text{OX}) \quad (1)$$

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 CH₄ 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.

$$\text{DOC} = 0.4 \cdot A + 0.17 \cdot B + 0.15 \cdot C + 0.3 \cdot D \quad (2)$$

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 CH₄ that is produced. According to Ayalon et al., the efficiency of CH₄ being captured varies from 40 to 90%. As far as the country of Israel is concerned, the average efficiency that the paper proposes is 50%, so in the calculations this efficiency for the CH₄ capturing process is being used.

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

Table 23 - Waste Emissions Calculation factors

| Variable | Value / Equation |
|----------|--------------------------------------|
| MSWt | 46 Gigagrams |
| MSWf | 0.7447 |
| MCF | 1 |
| DOC | 0.1689 |
| DOCf | 0.56 (T average in Israel) |
| F | 0.5 |
| 16/12 | |
| R | 1.07059 Gigagrams of CH ₄ |
| OX | 0 |

The result of equation 1, according to the Table 23 values, equals to **1.07059 Gigagrams of CH₄ or 1,070.6 tonnes.**

Conversion factor from methane to carbon dioxide used was according to 2006 IPCC Guidelines, namely 25, which equals to **26,765 tn CO₂.**

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2.6 CO₂ Emissions

The emissions of CO₂ 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 Ramla

| Sector | CO ₂ emissions [t]/ CO ₂ equivalent emissions [t] | | | | | | | | | | | | | | | Total | |
|--|---|-------------|--------------|-----------------|-------------|-------------------|------------------|-------------|-------------|--------------------|-------------|-------------|---------------|---------------|-------------|-------------|-------------------|
| | Electricity | Heat/c old | Fossil fuels | | | | | | | Renewable energies | | | | | | | |
| | | | 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 | 6.698,18 | | | | | | | | | | | | | | | | 6.698,18 |
| Tertiary (non municipal) buildings, equipment/facilities | 251.961,00 | | | | | | | | | | | | | | | | 251.961,00 |
| Residential buildings | 231.004,95 | | | 4.152,92 | | | | | | | | | | 0,00 | | | 235.157,87 |
| Municipal public lighting | 3.952,96 | | | | | | | | | | | | | | | | 3.952,96 |
| Industries | Non-ETS | 204.800,20 | | | | | | | | | | | | | | | 204.800,20 |
| | ETS (not recommen | 0,00 | | | | | | | | | | | | | | | 0,00 |
| | Total | 204.800,20 | 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 | 204.800,20 |
| Subtotal | 698.417,29 | 0,00 | 0,00 | 4.152,92 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 702.570,21 |
| TRANSPORT: | | | | | | | | | | | | | | | | | |
| Municipal fleet | | | | | | 94,75 | 145,71 | | | | | | | | | | 240,47 |
| Public transport | | | | | | 2.295,06 | | | | | | | | | | | 2.295,06 |
| Private and commercial transport | | | | | | 101.946,94 | 74.077,69 | | | | | | | | | | 176.024,63 |
| Subtotal | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 104.336,76 | 74.223,40 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 178.560,16 |
| OTHER: | | | | | | | | | | | | | | | | | |
| Agriculture | 5.057,70 | | | | | | | | | | | | | | | | |
| OTHER NON ENERGY RELATED: | | | | | | | | | | | | | | | | | |
| Waste management | | | | | | | | | | | | | | | | | 26.765,00 |
| Waste water management | | | | | | | | | | | | | | | | | |
| TOTAL | 703.474,99 | 0,00 | 0,00 | 4.152,92 | 0,00 | 104.336,76 | 74.223,40 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 912.953,07 |

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 Ramla equal to **912,953.07 tn CO₂**.

Chapter 3 : SEAP Actions

3.1 Target for 2020

The municipality's representatives, through the BEI identification, acknowledged the most significant sectors affecting their carbon footprint, namely the commercial sector with almost 27.3% contribution, followed largely behind by the residential (25.5%), and the industry sectors (22.3%). These sectors thus constitute the fields where the municipality's priority actions will be focused, while at the same time actions will be suggested in the other directions as well.

In this respect, the use of the Business as Usual (BAU) scenario suggested by the JRC guidelines for South municipalities is utilized for the calculation of the 2020 emission levels and the respective reduction target.

According to the guidelines, the calculation of 2020 emission levels is realized according to the equation below

$$Emissions_{CO_2}^{2020} = Emissions_{CO_2}^{Baseline\ year} \times k$$

For Ramla, the emissions for the baseline year (2011) were 921,047.08 tn CO₂. The national coefficient k for 2011 in Israel is 1.27. Therefore, the forecasted emissions for 2020 are

$$Emissions_{CO_2}^{2020} = 912,953.07 \times 1.27 = 1,159,450.40$$

Therefore, the emission reduction target for Ramla will be at least 20% against the calculated 2020 emissions, thus 231,890.08 tn CO₂. The actual reduction target undertaken by the municipality is 20.00%, corresponding to an overall reduction of 231,954.3 tn CO₂ by 2020. Each sector's contribution in the overall reduction target is presented in Figure 17 below.

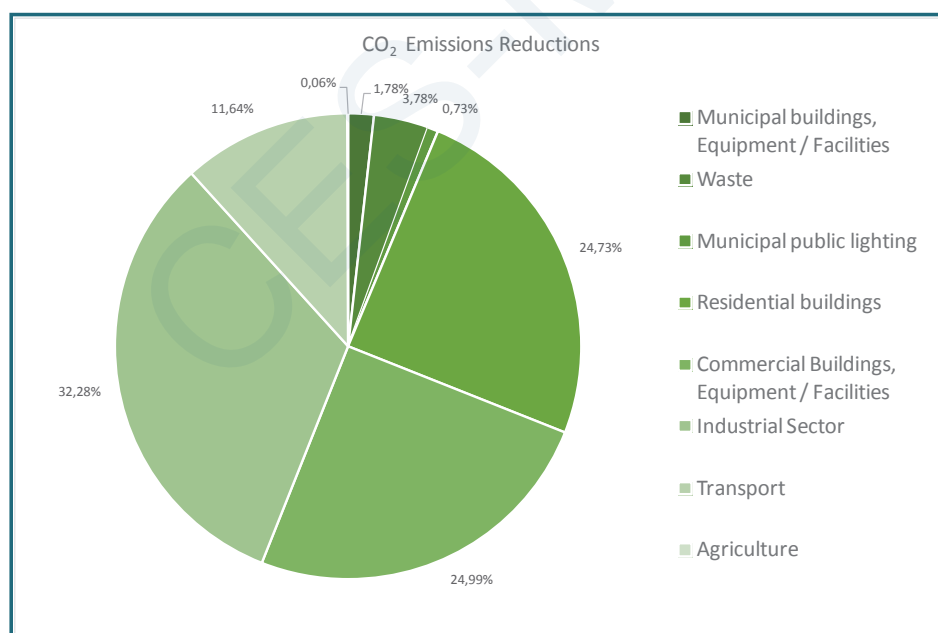


Figure 17 - Contribution per sector to the total CO₂ emission reduction

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

Table 25 - Summary of the actions

| Action No | Action | Emission Reductions (tn CO ₂) |
|---|---|---|
| Municipal buildings, Equipment / Facilities | | |
| 1.1 | Green procurement procedures for municipal buildings | 106.73 |
| 1.2 | Upgrade of the municipal buildings' and facilities' lighting system | 180.72 |
| 1.3 | LED lighting in new municipal projects | 52.71 |
| 1.4 | Upgrade of the municipal buildings' and facilities' A/C systems | 878.51 |
| 1.5 | Installation of automations in municipal buildings and facilities | 502.00 |
| 1.6 | Energy Manager appointment in the Municipality | 34.82 |
| 1.7 | Awareness raising activities for municipal employees | 11.92 |
| 1.8 | Shadings' installation in the municipal buildings' southern façade | 376.51 |
| 1.9 | The 10% commitment campaign for schools | 236.58 |
| 1.10 | Awareness raising campaigns for pupils/ students | 52.57 |
| 1.11 | Increase of natural lighting in municipal buildings | 37.65 |
| 1.12 | Use of cool colours on municipal buildings and facilities' roofs | 150.60 |
| 1.13 | Promotion of recycling | 6,798.31 |
| 1.14 | Awareness raising campaigns to reduce the amounts of discarded food (reduction of the organic content of waste) | 2,039.49 |
| 1.15 | Installation of 2 MW PVs in municipal buildings' rooftops | 1,440.00 |
| 1.16 | Construction of a municipal green building as demonstration project | 100.40 |
| Municipal public lighting | | |
| 2.1 | Municipal lighting study | 0.00 |
| 2.2 | Municipal lighting system upgrade | 1,604.95 |
| 2.3 | Solar street lighting signs | 30.00 |
| 2.4 | Upgrading traffic lights | 64.09 |
| Residential buildings | | |
| 3.1 | The 10% voluntary commitment campaign | 21,613.00 |
| 3.2 | Promotion of Green Buildings' concept | 5,672.70 |
| 3.3 | Campaign for substitution of old fridges, ACs and lamps | 8,277.23 |
| 3.4 | Information & awareness raising activities | 7,204.33 |
| 3.5 | Initiatives supporting citizens' actions | 2,401.44 |
| 3.6 | Establishment of the municipal team | 3,602.16 |
| 3.7 | 6 MW Photovoltaics in residential rooftops | 4,320.00 |
| 3.8 | Voluntary agreement with Building Constructors to promote green building concepts | 2,042.17 |
| 3.9 | Awareness raising activities for the residential buildings' associations | 2,668.27 |
| Commercial Buildings, Equipment / Facilities | | |
| 4.1 | Seminars to professional groups | 5,238.60 |
| 4.2 | On-going training to professional groups | 13,096.49 |
| 4.3 | 10% voluntary commitment campaign | 15,715.79 |
| 4.4 | Promotion of green buildings' concept | 9,167.54 |
| 4.5 | Other information and awareness raising activities | 6,548.24 |
| 4.6 | 12 MW photovoltaics on building rooftops | 8,640.00 |
| Industrial Sector | | |
| 5.1 | Subsidized energy audits at a volunteer basis | 15,967.71 |
| 5.2 | Targeted training seminars | 7,451.60 |
| 5.3 | 10% voluntary commitment campaign | 14,903.20 |
| 5.4 | On-going training provision | 10,645.14 |
| 5.5 | Switch to a "cleaner" electricity provider | 26,470.91 |
| Transport | | |
| 6.1 | Replacement of the municipal vehicles with new and more efficient | 21.10 |
| 6.2 | Efficient management of the municipal fleet | 6.11 |
| 6.3 | Maintenance of the municipal fleet | 19.85 |
| 6.4 | Eco-driving seminars for the municipal fleet's drivers | 30.54 |

| Action No | Action | Emission Reductions (tn CO ₂) |
|--------------------|---|---|
| 6.5 | Awareness raising on new vehicle technologies | 8,942.05 |
| 6.6 | Transportation master plan | 0.00 |
| 6.7 | Improve public transportation | 4,120.67 |
| 6.8 | Cycling promotion and creation of related infrastructure | 500.00 |
| 6.9 | Promotion of walking, car sharing and car pooling campaigns | 2,747.11 |
| 6.10 | Improvement / development of parking infrastructure | 3,090.50 |
| 6.11 | Adoption of real time information in public transport | 1,030.17 |
| 6.12 | Promotion of eco-driving | 2,322.81 |
| 6.13 | Promotion of new technology buses in the public transportation | 1,061.92 |
| 6.14 | Traffic congestion reduction through adoption of different timing of activities | 3,299.23 |
| Agriculture | | |
| 7.1 | Awareness raising activities | 151.73 |
| TOTAL | | 233,688.89 |

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 Ramla Municipality contribute with less than 2% in the total municipal 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 and can set an example for the citizens and the employees. In the following sections, a comprehensive set of actions is being analysed, in order to reduce the CO₂ emissions from this category.

The envisaged actions for this sector include both energy conservation and green energy production measures, with emphasis being placed 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 Table 26 on the next page.

Table 26 - Proposed Actions for the Municipal Buildings, Equipment / Facilities

| Action No | Action | Emission Reductions (tn CO ₂) |
|-----------|---|---|
| 1.1 | Green procurement procedures for municipal buildings | 106.73 |
| 1.2 | Upgrade of the municipal buildings' and facilities' lighting system | 180.72 |
| 1.3 | LED lighting in new municipal projects | 52.71 |
| 1.4 | Upgrade of the municipal buildings' and facilities' A/C systems | 753.00 |
| 1.5 | Installation of automations in municipal buildings and facilities | 502.00 |
| 1.6 | Energy Manager appointment in the Municipality | 34.82 |
| 1.7 | Awareness raising activities for municipal employees | 11.92 |
| 1.8 | Shadings' installation in the municipal buildings' southern façade | 376.51 |
| 1.9 | The 10% commitment campaign for schools | 236.58 |
| 1.10 | Awareness raising campaigns for pupils/ students | 52.57 |
| 1.11 | Increase of natural lighting in municipal buildings | 37.65 |
| 1.12 | Use of cool colours on municipal buildings and facilities' roofs | 301.21 |
| 1.13 | Promotion of recycling | 6,798.31 |
| 1.14 | Awareness raising campaigns to reduce the amounts of discarded food (reduction of the organic content of waste) | 2,039.49 |
| 1.15 | Installation of 2 MW PVs in municipal buildings' rooftops | 1,440.00 |
| 1.16 | Construction of a municipal green building as demonstration project | 100.40 |

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 Ramla, 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 27 below. The cost estimation refers to the additional cost of the highly energy efficient products compared to the compatible solutions.

Table 27 - Action 1.1 in numbers

| Action 1.1: Green procurement procedures | |
|---|---------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 200,000 NIS |
| Annual Energy Savings (MWh) | 177.88 MWh |
| Annual Emission Reduction (tn CO ₂) | 106.73 tn CO ₂ |
| Funding Source | Own sources |
| Net Present Value (NPV) | 257,750 NIS |

3.2.2 Upgrading the municipal buildings' and facilities' lighting system

According to studies, in a typical office building in Israel, lighting accounts for 30% of the overall electricity 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. These initiatives are expected to contribute with 30% energy savings against the buildings' BAU lighting 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 28 below.

Table 28 - Action 1.2 in numbers

| Action 1.2: Upgrading municipal buildings' and facilities lighting system | |
|--|----------------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 750,000 NIS |
| Annual Energy Savings (MWh) | 301.21 MWh |
| Annual Emission Reduction (tn CO2) | 180.72 tn CO2 |
| Funding Source | EU + Government (Min. of Energy) |
| Net Present Value (NPV) | 25,100 NIS |

3.2.3 LED lighting in new municipal projects

Although Ramla is not facing a rapid population increase phenomenon, the municipality's population is expected to grow by 3,000 households till 2020, in the new neighbourhood being built. This increase creates the need for additional municipal buildings and facilities. The municipality plans to use LED lighting in all these newly built facilities, thus reducing the energy consumptions against the BAU scenario for 2020.

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 below.

Table 29 - Action 1.3 in numbers

| Action 1.3: LED lighting in new municipal projects | |
|---|--------------|
| Duration | 2017-2020 |
| Total Implementation Cost (NIS) | 200,000 NIS |
| Annual Energy Savings (MWh) | 87.85 MWh |
| Annual Emission Reduction (tn CO2) | 52.71 tn CO2 |
| Funding Source | Own sources |
| Net Present Value (NPV) | 26,100 NIS |

3.2.4 Upgrade of the municipal buildings and facilities' AC systems

The climate conditions in Israel are especially challenging during the summer, characterized by high temperatures and humidity. According to the National Energy Efficiency Program Reducing Electricity Consumption 2010-2020 study, by the Ministry of National Infrastructures, air conditioning (A/C) is the most significant energy consumer in buildings, with contribution percentages reaching up to 50-60% of the total office building energy consumption.

The specific action envisages the gradual replacement of all A/C split units in municipal buildings and facilities by 2020, including educational buildings, with inverter A/C units of high energy class. This activity is expected to contribute with 15% energy savings of the municipal buildings' consumptions by 2020.

Related calculations on the action, which has already been initiated, in terms of initial cost, energy and emission savings, as well as financial viability are presented in Table 30 below.

This action constitutes a priority for the municipality, and for this reason is further developed in a project fiche.

Table 30 - Action 1.4 in numbers

| Action 1.4: Upgrading of the Municipal buildings and facilities' AC systems | |
|--|----------------------------------|
| Duration | 2014-2020 |
| Total Implementation Cost (NIS) | 4,000,000 NIS |
| Annual Energy Savings (MWh) | 1,255.00 MWh |
| Annual Emission Reduction (tn CO2) | 753.00 tn CO2 |
| Funding Source | EU + Government (Min. of Energy) |
| Net Present Value (NPV) | 1,950,000 NIS |

3.2.5 Installation of automations in municipal buildings and facilities

Upgrading of the existing equipment is a significant measure to reduce energy consumption in the respective buildings and facilities. However, this technological upgrade doesn't have any impact on the users' behaviour. A way to reduce the effect of the users' energy habits, although it has no direct impact on the modification of their behaviour, relies on the installation of automations, such as thermostats, timers, movement sensors etc. In this way, the users are being monitored and consumptions outside the normal office working hours are being avoided.

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.

Table 31 - Action 1.5 in numbers

| Action 1.5: Installation of automations in municipal buildings and facilities | |
|--|-------------------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 500,000 NIS |
| Annual Energy Savings (MWh) | 836.68 MWh |
| Annual Emission Reduction (tn CO2) | 502.00 tn CO2 |
| Funding Source | Own sources + Gov. (Min. of Energy) |
| Net Present Value (NPV) | 1,650,000 NIS |

3.2.6 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. In this respect, this action focuses not only on the satisfaction of the above mentioned prerequisites, but goes well beyond them.

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 32. 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 encouraging. In case a member of the existing municipality staff is appointed to this position, this will have even greater benefits to the municipality.

Table 32 – Action 1.6 in numbers

| Action 1.6: Municipality energy manager | |
|--|--|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 500,000 NIS |
| Annual Energy Savings (MWh) | 58.03 MWh |
| Annual Emission Reduction (tn CO₂) | 34.82 tn CO ₂ |
| Funding Source | Own sources + Gov. (Min of Energy, Interior) |
| Net Present Value (NPV) | NPV ≈ 0 |

3.2.7 Awareness raising activities for municipal employees

A step of significant importance, in order to promote and achieve the planned initiatives, is to have properly communicated the municipality's 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, embracing 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 Ramla 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 33. Such actions are more difficult to be quantified; however, it is considered that the financial viability of the action is ensured.

Table 33 - Action 1.7 in numbers

| Action 1.7: Awareness raising activities for municipal employees | |
|---|--------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 50,000 NIS |
| Annual Energy Savings (MWh) | 19.87 MWh |
| Annual Emission Reduction (tn CO₂) | 11.92 tn CO ₂ |
| Funding Source | Own sources |
| Net Present Value (NPV) | > 0 |

3.2.8 Shadings' installation in the municipal buildings' southern facade

As mentioned in the above actions, high temperatures and the respective need for air-conditioning constitute a continuous challenge for the country. If this fact is combined with the lack of thermal insulation in buildings and their high investment cost, then it is evident that other technological solutions should be identified to curtail the related energy consumptions. Such a solution is installation of shadings, especially in the southern façade of the municipal buildings, including the educational ones. It is considered that such an investment can lead to significant energy savings and improvement of living conditions in these buildings.

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 34.

Table 34 - Action 1.8 in numbers

| Action 1.8: Shadings' installation in the municipal buildings' southern facade | |
|---|--|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 1,500,000 NIS |
| Annual Energy Savings (MWh) | 627.51 MWh |
| Annual Emission Reduction (tn CO2) | 376.51 tn CO2 |
| Funding Source | Own sources + Government (Min. of Energy, Environment) |
| Net Present Value (NPV) | 115,000 NIS |

3.2.9 The 10% commitment campaign for schools

Another set of action 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 voluntary 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, schoolchildren 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 1.9 in numbers

| Action 1.9: The 10% commitment campaign for schools | |
|--|--|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 100,000 NIS |
| Annual Energy Savings (MWh) | 394.30 MWh |
| Annual Emission Reduction (tn CO2) | 236.58 tn CO2 |
| Funding Source | Own funding + Government (Ministry of Energy, Education, Environment) |
| Net Present Value (NPV) | > 0 |

3.2.10 Awareness raising campaigns for pupils and students

Apart from the suggested actions above, this action has been designed for those schools that will not participate in them. It is estimated that the above actions will engage half of the municipal schools, so for the other half, 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 1.10 in numbers

| Action 1.10: Awareness raising campaigns for pupils and students | |
|---|---|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 40,000 NIS |
| Annual Energy Savings (MWh) | 87.62 MWh |
| Annual Emission Reduction (tn CO2) | 52.57 tn CO2 |
| Funding Source | Own sources + Government (Min. of Education, Environment) |
| Net Present Value (NPV) | > 0 |

3.2.11 Increase of natural lighting in municipal buildings

Lighting is the second highest energy consuming category in office buildings. Besides technological upgrade of the lighting solutions adopted in the buildings, due to the exceptionally high amounts of sunshine available in the country, the municipality of Ramla considers adopting the increase of the use of natural lighting in its facilities. This measure affects both existing and planned buildings, with the existing ones requiring certain reconstruction works; 5% reduction from lighting energy consumptions is expected from this measure.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 37.

Table 37 - Action 1.11 in numbers

| Action 1.11: Increase of natural lighting use in municipal buildings | |
|---|--|
| Duration | 2017-2020 |
| Total Implementation Cost (NIS) | 300,000 NIS |
| Annual Energy Savings (MWh) | 62.75 MWh |
| Annual Emission Reduction (tn CO₂) | 37.65 tn CO ₂ |
| Funding Source | Own sources + Government (Min. of Energy, Education) |
| Net Present Value (NPV) | NPV < 0 |

3.2.12 Use of cool colours in municipal roofs

According to the National Energy Efficiency Program Reducing Electricity Consumption 2010-2020 study, by the Ministry of National Infrastructures, there are three main courses of action that should be undertaken in order to manifest the efficiency programs in the local authorities' sector: Support incentives for the upgrade of lighting systems, air-conditioning systems, and thermal treatment of roofs.

Electricity consumption by acclimatization systems (cooling and heating) comprises about 40% of local authorities' energy consumption, and about 50-60% of the energy consumed in buildings. 10% of the overall energy consumed by acclimatization systems can be saved by mere treatment of buildings' roofs, which is relatively cheap.

Use of cool colours and/or materials is easily applied on the building since what is required is to paint the roofs with these cool colours. In this action it is considered that cool roofs will contribute with a 12% reduction of the cooling loads (approximately 6% of the overall electricity consumption), since the majority of the suggested buildings are one or two storeys high. Overall, 20 buildings are considered for this action, with an available roof area of 6,000m² approximately.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 38.

This action constitutes a priority for the municipality, and for this reason is further developed in a project fiche.

Table 38 - Action 1.12 in numbers

| Action 1.12: Use of cool colours in municipal roofs | |
|--|--|
| Duration | 2016-2017 |
| Total Implementation Cost (NIS) | 300,000 NIS |
| Annual Energy Savings (MWh) | 502.01 MWh |
| Annual Emission Reduction (tn CO₂) | 301.21 tn CO ₂ |
| Funding Source | Own sources + Gov. (Min. of Energy) + EU |
| Net Present Value (NPV) | 195,000 NIS |

3.2.13 Promotion of recycling

As waste contributes a little under 3% to the total municipal emissions, the municipality of Ramla is dedicated to actively implement awareness activities to promote the recycling context, which is currently a little over 25%. This is in line with the target set for 2007 under Collection and Disposal of Waste for Recycling Law of 1993.

The municipality wishes to promote recycling among the residents in order to increase by 20% the recycling rate by 2020, achieving a total of 45% recycling. This will be achieved through the enhancement of the already established infrastructures (installation of recycle bins, collection of waste

for recycling) and 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. Special events for schoolchildren will be realized as well.

The municipality will ensure that the proper infrastructure (recycling bins and vehicles) is available for the waste sorting and collection on the streets, including recycling of electrical devices. Furthermore, in order to lead by example, the municipality will install recycling bins in all municipal buildings and facilities, promoting the use of recycled paper for the local administration, in relation to green procurement action referred above.

Although no energy savings will be achieved through this action, the estimated emission reductions will be in line with the recycling rate achieved.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 39. 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. The larger part of the initial cost concerns the related infrastructure, assuming a density of 20 recycling bins per 1,000 citizens. Collaboration contracts will be signed with the respective recycling companies for the collection and handling of waste for recycling.

Table 39 - Action 1.13 in numbers

| Action 1.13: Promotion of recycling | |
|--|--|
| Duration | 2012-2020 |
| Total Implementation Cost (NIS) | 3,000,000 NIS |
| Annual Energy Savings (MWh) | 0 MWh |
| Annual Emission Reduction (tn CO2) | 6,798.31 tn CO2 |
| Funding Source | Ministry of Environmental Protection + Own sources |
| Net Present Value (NPV) | 635,000 NIS |

3.2.14 Awareness raising campaigns to reduce the amounts of discarded food

One major source of GHG emissions for the municipality is waste. In an effort to reduce emissions from this source, the municipality of Ramla 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 schoolchildren will be realized as well.

Although no energy savings will be achieved through this action, the estimated emission reductions will be approximately 6.0%.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 40. 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 40 - Action 1.14 in numbers

| Action 1.14: Reducing the organic content of waste | |
|--|---------------------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 150,000 NIS |
| Annual Energy Savings (MWh) | 0 MWh |
| Annual Emission Reduction (tn CO2) | 2,039.49 tn CO2 |
| Funding Source | Own funding + Ministry of Environment |
| Net Present Value (NPV) | > 0 |

3.2.15 Installation of 2MW 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 Ramla being 1,845 kWh/m².

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 the municipal buildings and facilities so as to install 2MW. 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 (m²)

r: Solar panel yield (Considered 15%)

H: Annual average solar radiation (1,845 kWh/m² for Ramla)

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 41 below. It should be noted that the NPV is calculated during the lifetime of the PV panels, namely for 20 years.

Table 41 - Action 1.15 in numbers

| Action 1.15 : 2 MW PVs in municipal rooftops | |
|--|-----------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 10,000,000 NIS |
| Annual Energy Savings (MWh) | 2,400.00 MWh |
| Annual Emission Reduction (tn CO2) | 1,440.00 tn CO2 |
| Funding Source | IFIs + Donors |
| Net Present Value (NPV) | 4,000,000 NIS |

3.2.16 Construction of a municipal green building as demonstration project

This action focuses on the design and development of a new municipal building according to the green building principles. Its purpose will be to serve as a demonstration project for the citizens, in order to showcase the modern energy efficient technologies and practices and the tangible results in the improvement of the living standards of its dwellers. This building will adopt passive house

concepts, while 200kW PVs of those scheduled in action 1.15 will be installed in this building, in an effort to make it self sufficient and nearly zero energy building. The achieved emission reductions from the energy savings have been included in action 1.15.

However, the energy savings and respective emission reductions till 2020 are considered to be generated by the impact of the demonstration project on the public. The particular action has a positive return on investment, considering only the additional initial cost required for the green building and its adopted technologies.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 42 below.

Table 42 - Action 1.16 in numbers

| Action 1.16: Construction of a Green Municipal Building (as a pilot project) | |
|---|-----------------|
| Duration | 2018-2020 |
| Total Implementation Cost (NIS) | 1,500,000 NIS |
| Annual Energy Savings (MWh) | 167.34 MWh |
| Annual Emission Reduction (tn CO2) | 100.40 tn CO2 |
| Funding Source | IFIs and Donors |
| Net Present Value (NPV) | > 0 |

3.3 Municipal Public Lighting

The municipal public lighting sector consists of two main consumers, street and traffic lighting, with traffic lighting being a very small percentage. However, the suggested actions in this sector focus on both categories, with the planned measures being relatively low costs actions with immediate results.

Table 43 - Proposed Actions in the Municipal Public Lighting Sector

| Action No | Action | Emission Reductions (tn CO2) |
|------------------|-----------------------------------|-------------------------------------|
| 2.1 | Municipal lighting study | 0.00 |
| 2.2 | Municipal lighting system upgrade | 1,604.95 |
| 2.3 | Solar street lighting signs | 30.00 |
| 2.4 | Upgrading traffic lights | 64.09 |

3.3.1 Municipal lighting study

The municipality of Ramla currently has some fragmentary studies on the municipal lighting, but not a consolidated one. It is therefore 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 CO₂ 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 following table.

Table 44 – Action 2.1 in numbers

| Action 2.1: Municipal lighting study | |
|---|-------------|
| Duration | 2013-2016 |
| 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 has to do with 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 metal halide (HPIT Mercury, HQI Mercury Halide etc.) lamps 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.
- 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.

It is envisaged that an overall saving of 40% can be achieved through the enforcement of the above mentioned priority axes.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 45.

Table 45 – Action 2.2 in numbers

| Action 2.2: Municipal lighting system upgrade | |
|--|--|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 4,000,000 NIS |
| Annual Energy Savings (MWh) | 2,340.56 MWh |
| Annual Emission Reduction (tn CO2) | 1,521.36 tn CO2 |
| Funding Source | Loans (ESCO) + Government (Ministry of Energy) |
| Net Present Value (NPV) | 4,000,000 NIS |

3.3.3 *Solar street lighting signs*

This particular action has already started in a pilot project, where lighting posts were upgraded with LED lamps during the period 2012-2014 and constitutes an effort to utilize the abundant solar radiation in the street lighting. This action is expected to continue by 2020 in other neighbourhoods. The installation of solar street lighting signs is a great opportunity for the municipality to demonstrate a different use of solar energy to its citizens.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 46.

Table 46 - Action 2.3 in numbers

| Action 2.3: Solar street lighting signs | |
|--|-------------------------------------|
| Duration | 2012-2020 |
| Total Implementation Cost (NIS) | 200,000 NIS |
| Annual Energy Savings (MWh) | 50.00 MWh |
| Annual Emission Reduction (tn CO2) | 30.00 tn CO2 |
| Funding Source | Own sources + Gov. (Min. of Energy) |
| Net Present Value (NPV) | 108,000 NIS |

3.3.4 Upgrade traffic lights

The traffic lights constitute a very small part of the street lighting network's consumptions. Nevertheless, due to the fact that they were technologically outdated, the municipality decided to proceed in their replacement with new ones that would ensure 75% reduction in the energy consumptions.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 47.

Table 47 - Action 2.4 in numbers

| Action 2.4: Upgrade traffic lights | |
|---|--------------|
| Duration | 2012-2014 |
| Total Implementation Cost (NIS) | 300,000 NIS |
| Annual Energy Savings (MWh) | 106.82 MWh |
| Annual Emission Reduction (tn CO2) | 64.09 tn CO2 |
| Funding Source | Own sources |
| Net Present Value (NPV) | 390,000 NIS |

3.4 Residential Buildings

The residential sector in Ramla is one of the highest consumers and emitters, with almost 26% of the total municipal emissions. 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 Ramla is presented in Table 48.

Table 48 - Proposed Actions for the Residential Buildings

| Action No | Action | Emission Reductions (tn CO2) |
|-----------|---|------------------------------|
| 3.1 | The 10% voluntary commitment campaign | 21,613.00 |
| 3.2 | Promotion of Green Buildings' concept | 5,672.70 |
| 3.3 | Campaign for substitution of old fridges, ACs and lamps | 8,277.23 |
| 3.4 | Information & awareness raising activities | 7,204.33 |
| 3.5 | Initiatives supporting citizens' actions | 2,401.44 |
| 3.6 | Establishment of the municipal team | 3,602.16 |
| 3.7 | 6 MW Photovoltaics in residential rooftops | 4,320.00 |
| 3.8 | Voluntary agreement with Building Constructors to promote green building concepts | 2,042.17 |
| 3.9 | Awareness raising activities for the residential buildings' committees | 2,668.27 |

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 as well, 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 49. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 49 - Action 3.1 in numbers

| Action 3.1: The 10% voluntary commitment campaign | |
|---|---|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 450,000 NIS |
| Annual Energy Savings (MWh) | 36,021.65 MWh |
| Annual Emission Reduction (tn CO2) | 21,613.00 tn CO2 |
| Funding Source | Government (Min. of Energy, Environment + EU) |
| 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.

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 be mainly focusing 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. Low cost efficient technologies will be promoted as well, such as the use of energy efficient lamps (e.g. LEDs). The green municipal building will serve as a demonstration basis of these technologies and the existing potential for energy and cost reductions.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 50. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 50 - Action 3.2 in numbers

| Action 3.2: Promotion of green buildings' concept | |
|---|--|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 200,000 NIS |
| Annual Energy Savings (MWh) | 9,454.50 MWh |
| Annual Emission Reduction (tn CO2) | 5,672.70 tn CO2 |
| Funding Source | Own funding + Gov. (Min. of Energy, Environment, Building) |
| Net Present Value (NPV) | > 0 |

3.4.3 Campaign for old ACs, lamps and fridges substitution

Air-conditioning (A/C), lighting and domestic white appliances comprise the greatest energy consumers in the residential sector.

According to the National Energy Efficiency Program – Reducing electricity consumption 2010-2020, by the MIEW, the expected annual energy savings per household due to the use of energy efficient refrigerators following the regulation change, as of 2012, is estimated at 1,278 kWh, while due to the use of energy efficient A/Cs 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 Ramla 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 fridge with the simultaneous retraction of the old appliance will be subsidized for at least 2,000 households, at a percentage of 30%. The households to be benefitted from the same measure regarding ACs will be 3,500, while an additional 5,500 households taking advantage of the offered subsidies regarding the light bulbs. In this way, by 2020, at least 1 out of 2 houses will have benefitted from one of these subsidies. If strict financial criteria are to be considered for the beneficiaries, in order to have the most in need taking advantage of the action, 2,000 households will benefit from all three measures, while another 1,500 will benefit from the substitution of ACs and lamps.

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 51. The action doesn't create monetary savings for the municipal authority. The NPV for the households benefitting from the action is positive.

This action constitutes a priority for the municipality, and for this reason is further developed in a project fiche.

Table 51 - Action 3.3 in numbers

| Action 3.3: Campaign for old ACs, lamps and fridges substitution | |
|---|-----------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 3,600,000 NIS |
| Private Funds Mobilised (NIS) | 8,400,000 NIS |
| Annual Energy Savings (MWh) | 10,862.50 MWh |
| Annual Emission Reduction (tn CO2) | 8,277.23 tn CO2 |
| Funding Source | 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 52 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 52 - 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) | 12,007.22 MWh |
| Annual Emission Reduction (tn CO2) | 7,204.33 tn CO2 |
| Funding Source | Own sources + 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 Ramla 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 53 below.

Table 53 - Action 3.5 in numbers

| Action 3.5: Initiatives supporting citizens' actions | |
|--|-----------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 100,000 NIS |
| Annual Energy Savings (MWh) | 4,002.41 MWh |
| Annual Emission Reduction (tn CO2) | 2,401.44 tn CO2 |
| 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. The 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 54 below.

Table 54 - Action 3.6 in numbers

| Action 3.6: Establishment of the municipal team (Energy Efficiency Department) | |
|---|--|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 1,400,000 NIS |
| Annual Energy Savings (MWh) | 6,003.61 MWh |
| Annual Emission Reduction (tn CO₂) | 3,602.16 tn CO ₂ |
| Funding Source | Own funding + Government (Min. of Energy, Environment, Interior) |
| Net Present Value (NPV) | > 0 |

3.4.7 6 MW Photovoltaics in residential rooftops

The high levels of solar energy potential in the area of the Municipality favour the installation of photovoltaics 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.

The solar energy potential for the country is one of the highest in the MEDA region, with the average amount of solar energy for Ramla being 1,845 kWh/m². 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 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 (m²)

r: Solar panel yield (Considered 15%)

H: Annual average solar radiation (1,845 kWh/m² for Ramla)

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

Related calculations on the action are presented in Table 55. 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 55 - Action 3.7 in numbers

| Action 3.7: 6 MW Photovoltaics in residential rooftops | |
|---|-----------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 100,000 NIS |
| Expected Private Funds Mobilised (NIS) | 50,400,000 NIS |
| Annual Energy Savings (MWh) | 7,200.00 MWh |
| Annual Emission Reduction (tn CO₂) | 4,320.00 tn CO ₂ |
| Funding Source | Own sources |
| Net Present Value (NPV) | > 0 |

3.4.8 Voluntary agreement with building constructors to promote the Green Buildings' concepts

As previously mentioned, Ramla is planning a new neighbourhood in the coming decade. It is expected that by 2020, at least 3,000 new households will have been built. This constitutes an excellent opportunity for the municipality to promote as much as possible the green building concepts among the construction companies.

In this respect, the municipality is planning to achieve voluntary agreements with the construction companies that have undertaken the new neighbourhood project, highlighting the activity's importance for the municipality and the Mayor. Meetings will be realized with each company's representatives, accompanied by a brief cost estimation and analysis and explaining the benefits this may have on the value of the real estate as well.

Moreover, Municipality of Ramla will hire an expert as a supervisor in the license reviewing process for the new buildings. The role of the expert will be to give an input on the green elements of the building, in order to contribute to more energy efficient buildings before the building process starts.

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.

For the calculation of the related savings, it is considered that selective measures from the above mentioned will be realised in order to achieve a 4% savings against conventional buildings. Related calculations on the action are presented in Table 56.

Table 56 - Action 3.8 in numbers

| Action 3.8: Voluntary agreement with building constructors to promote the Green Buildings' concepts | |
|---|-----------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 30,000 NIS |
| Expected Private Funds Mobilised (NIS) | 50,000,000 NIS |
| Annual Energy Savings (MWh) | 4,002.41 MWh |
| Annual Emission Reduction (tn CO ₂) | 2,601.56 tn CO ₂ |
| Funding Source | Own financing |
| Net Present Value (NPV) | > 0 |

3.4.9 Awareness raising activities for the Residential Buildings' Committees

The specific activity is targeting the members of the residential buildings' committees, in order to promote energy efficiency principles. In particular, every multi-family building (high-rise) has a committee that ensures the building's management in all related issues.

The municipality's plan is to target these committees and realize specific awareness raising activities for them, including information days and brief seminars, on the need for better energy management of the building, which will lead to energy and cost reductions. These committee members will not only adopt to a certain extent better management in their facilities, but will also pass the related information to the building tenants, ensuring a multiplying effect. It is expected that approximately 500 committee members will be reached through this activity.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 57 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 57 - Action 3.9 in numbers

| Action 3.9: Awareness raising activities for the Residents' Associations | |
|---|---|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 150,000 NIS |
| Annual Energy Savings (MWh) | 4,447.12 MWh |
| Annual Emission Reduction (tn CO2) | 2,668.27 tn CO2 |
| Funding Source | Own funds + Gov. (Min. of Energy, Building) |
| Net Present Value (NPV) | > 0 |

3.5 Commercial Buildings, Equipment / Facilities

Commercial buildings/equipment and facilities is the largest sector in GHG emissions in the area of Ramla, contributing 27.6% in the total municipal 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 Ramla is presented in Table 58 below.

Table 58 - Proposed Actions for the Commercial Buildings, Equipment / Facilities

| Action No | Action | Emission Reductions (tn CO2) |
|------------------|--|-------------------------------------|
| 4.1 | Seminars to professional groups | 5,238.60 |
| 4.2 | On-going training to professional groups | 13,096.49 |
| 4.3 | 10% voluntary commitment campaign | 15,715.79 |
| 4.4 | Promotion of green buildings' concept | 9,167.54 |
| 4.5 | Other information and awareness raising activities | 6,548.24 |
| 4.6 | 12 MW photovoltaics on building rooftops | 8,640.00 |

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 Ramla 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 20% 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.

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 4.1 in numbers

| Action 4.1: Seminars to professional groups | |
|--|-----------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 500,000 NIS |
| Annual Energy Savings (MWh) | 8,731.00 MWh |
| Annual Emission Reduction (tn CO2) | 5,238.60 tn CO2 |
| Funding Source | Ministry of Economics |
| Net Present Value (NPV) | > 0 |

3.5.2 Ongoing training of selected professional groups

There are two different educational approaches usually adopted for the training of professionals. The first one is described in action 4.1, where a larger number of people is reached out through brief training seminars. In order to ensure the targeted results, these training seminars will have to be repeated at a certain frequency. On the other hand, the second approach comprises of the ongoing training of the selected professionals. Since this action is on a longer term collaboration horizon, the municipality will work with members from the most energy intensive companies of the tertiary sector, such as hospitals, hotels, shopping malls etc. This ongoing training will be initiated by training from professionals such as energy auditors and engineers, while progress meetings will be realised at a frequency of 2-3 months. During this period, the trainee will have to demonstrate the progress realized in his facilities in terms of energy savings. The trainers will validate the results and will provide professional advice on additional ways to curtail energy consumption, acting as external energy advisors for these companies.

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

Table 60 - Action 4.2 in numbers

| Action 4.2: Ongoing training of selected professional groups | |
|---|-----------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 450,000 NIS |
| Annual Energy Savings (MWh) | 21,827.48 MWh |
| Annual Emission Reduction (tn CO2) | 13,096.49 tn CO2 |
| Funding Source | Ministry of Economics |
| Net Present Value (NPV) | > 0 |

3.5.3 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 introduction 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 61 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

This action constitutes a priority for the municipality, and for this reason is further developed in a project fiche.

Table 61 - Action 4.3 in numbers

| Action 4.3: 10% voluntary commitment campaign | |
|--|--|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 550,000 NIS |
| Annual Energy Savings (MWh) | 26,192.98 MWh |
| Annual Emission Reduction (tn CO2) | 15,715.79 tn CO2 |
| Funding Source | Own funding + Gov. (Min. of Economics, Energy) |
| Net Present Value (NPV) | > 0 |

3.5.4 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 as well, with the target that the rates with which citizens adopt such types of measures will be increased.

Customised sets of potential interventions and actions will be suggested to 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 focusing 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.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 62 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 62 - Action 4.4 in numbers

| Action 4.4: Promotion of green buildings' concept | |
|--|---|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 200,000 NIS |
| Annual Energy Savings (MWh) | 15,279.24 MWh |
| Annual Emission Reduction (tn CO2) | 9,167.54 tn CO2 |
| Funding Source | Own + Ministry of Energy, Min. of Economics |
| Net Present Value (NPV) | > 0 |

3.5.5 Other information and awareness raising activities

Apart from organising seminars, design and distribution of informative leaflets and brochures is planned; their content will be relevant to projects and funding schemes that act in favour of energy efficiency and green energy production. 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. Green procurement procedures will also be in the spotlight of such awareness raising activities.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 63 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 63 - Action 4.5 in numbers

| Action 4.5: Other information and awareness raising activities | |
|---|-----------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 100,000 NIS |
| Annual Energy Savings (MWh) | 10,913.74 MWh |
| Annual Emission Reduction (tn CO2) | 6,548.24 tn CO2 |
| Funding Source | Ministry of Economics |
| Net Present Value (NPV) | > 0 |

3.5.6 12 MW Photovoltaics on building rooftops

As mentioned before, the high levels of solar energy potential in the area of the Municipality favour the installation of photovoltaics 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 before.

Related calculations on the action are presented in Table 64, in line with the method presented under the residential 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 average investment is considered beneficial in its 20-year life span and assuming that energy prices will go up within this period, this is definitely an investment worth thinking of.

Table 64 - Action 4.6 in numbers

| Action 4.6: 12 MW Photovoltaics on rooftops | |
|--|-----------------|
| Duration | 2013-2020 |
| Total Implementation Cost (NIS) | 100,000 NIS |
| Expected Private Funds Mobilised (NIS) | 100,000,000 NIS |
| Annual Energy Savings (MWh) | 14,400.00 MWh |
| Annual Emission Reduction (tn CO2) | 8,640.00 tn CO2 |
| Funding Source | Own funding |
| Net Present Value (NPV) | > 0 |

3.6 Industrial Sector

The industrial sector is being responsible for about 22% of carbon emissions in the area of Ramla. There are two industrial zones in the local authorities' area. The first includes light industries and commercial spaces, while the second includes all the heavy industries with cement industries and a metal galvanising factory.

Table 65– Proposed Actions for the Industrial Sector

| Action No | Action | Emission Reductions (tn CO2) |
|------------------|---|-------------------------------------|
| 5.1 | Subsidized energy audits at a volunteer basis | 15,967.71 |
| 5.2 | Targeted training seminars | 7,451.60 |
| 5.3 | 10% voluntary commitment campaign | 14,903.20 |
| 5.4 | On-going training provision | 10,645.14 |
| 5.5 | Switch to a “cleaner” electricity provider | 26,470.91 |

3.6.1 Subsidized energy audits at a volunteer basis

The Israeli legal framework includes obligatory energy audits every 5 years for the large consumers that use more than 7,000 tons of oil equivalent (toe) annually. However, the industrial consumers are not obliged to implement any recommended action after the energy audits. The smaller industries are not obliged to perform any energy audit at all.

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 Ramla is planning to realize a program where subsidized energy audits will be offered to all 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 66.

Table 66 - 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 |
| Annual Energy Savings (MWh) | 26,612.85 MWh |
| Annual Emission Reduction (tn CO2) | 15,967.71 tn CO2 |
| Funding Source | Large Scale Industries: Ministry of Energy, Small and Medium Industries: Ministry of Economics |
| Net Present Value (NPV) | > 0 |

3.6.2 Targeted training seminars

Similar to the tertiary sector, the municipality of Ramla 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 70% 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 67.

Table 67 - Action 5.2 in numbers

| Action 5.2: Targeted training seminars | |
|---|-----------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 350,000 NIS |
| Annual Energy Savings (MWh) | 12,419.33 MWh |
| Annual Emission Reduction (tn CO2) | 7,451.60 tn CO2 |
| Funding Source | Ministry 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 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 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 68 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 68 - Action 5.3 in numbers

| Action 5.3: The 10% voluntary commitment campaign | |
|--|------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 80,000 NIS |
| Annual Energy Savings (MWh) | 24,838.66 MWh |
| Annual Emission Reduction (tn CO2) | 14,903.20 tn CO2 |
| Funding Source | Own sources |
| Net Present Value (NPV) | > 0 |

3.6.4 Ongoing training provision

Similar to action 4.2, this action focuses on the provision of ongoing training to selected stakeholders by professionals such as energy auditors and engineers. Following the period of the training, progress meetings will be realised at a frequency of 2-3 months. During this period, the trainee will have to demonstrate the progress realized in his facilities in terms of energy savings. The trainers will validate the results and will provide professional advice on additional ways to curtail energy consumption, acting as external energy advisors for these companies.

This action will also reinforce action 5.1 results on the energy audits.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 69 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 69 - Action 5.4 in numbers

| Action 5.4: Ongoing training provision | |
|---|-----------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 250,000 NIS |
| Annual Energy Savings (MWh) | 17,741.90 MWh |
| Annual Emission Reduction (tn CO2) | 10,645.14 tn CO2 |
| Funding Source | Ministry of Economics |
| Net Present Value (NPV) | > 0 |

3.6.5 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 Ramla Municipality, the eligible number of companies that will proceed in this switch represents at least 20% of the sector’s consumptions.

The action bears no cost for the municipality, and no energy savings, since the reductions in the CO₂ emissions are calculated as the difference between the two emission factors.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 70 below.

Table 70 - Action 5.5 in numbers

| Action 5.5: Switch to “cleaner” electricity provider | |
|---|------------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 0.00 NIS |
| Annual Energy Savings (MWh) | 0.00 MWh |
| Annual Emission Reduction (tn CO₂) | 26,470.91 tn CO ₂ |

3.7 Transport

Transportation is the largest energy consumer in the municipality of Ramla, with almost 19% contribution in the territory’s GHG emissions. The proposed actions in Table 71 focus on municipal, public and private transport.

Table 71 - Proposed actions for Transport

| Action No | Action | Emission Reductions (tn CO₂) |
|------------------|---|--|
| 6.1 | Replacement of the municipal vehicles with new and more efficient | 21.10 |
| 6.2 | Efficient management of the municipal fleet | 6.11 |
| 6.3 | Maintenance of the municipal fleet | 19.85 |
| 6.4 | Eco-driving seminars for the municipal fleet’s drivers | 30.54 |
| 6.5 | Awareness raising on new vehicle technologies | 8,942.05 |
| 6.6 | Transportation master plan | 0.00 |
| 6.7 | Improve public transportation | 4,120.67 |
| 6.8 | Cycling promotion and creation of related infrastructure | 500.00 |
| 6.9 | Promotion of walking, car sharing and car pooling campaigns | 2,747.11 |
| 6.10 | Improvement / development of parking infrastructure | 3,090.50 |
| 6.11 | Adoption of real time information in public transport | 1,030.17 |
| 6.12 | Promotion of eco-driving | 2,322.81 |
| 6.13 | Promotion of new technology buses in the public transportation | 1,061.92 |
| 6.14 | Traffic congestion reduction through adoption of different timing of activities | 3,299.23 |

3.7.1 Replacement of the municipal vehicles with new and more efficient

The municipal fleet in Ramla constitutes of 55 vehicles, the majority being of passenger type, but including some light duty vehicles as well.

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 Ramla, 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 or hybrid natural gas) for 5 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 72 below.

Table 72 - Action 6.1 in numbers

| Action 6.1: Replacement of the municipal vehicles with new and more efficient | |
|--|------------------------------|
| Duration | 2013-2020 |
| Total Implementation Cost (NIS) | 5,500,000 NIS |
| Annual Energy Savings (MWh) | 82.78 MWh |
| Annual Emission Reduction (tn CO ₂) | 21.10 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 CO₂ 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 2% of the energy consumptions is expected as a result of this activity. Already the municipality has initiated efforts in the past years for the better management of the municipal fleet. This action focuses on the improvement of this procedure.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 73 below.

Table 73 - Action 6.2 in numbers

| Action 6.2: Efficient management of the municipal fleet | |
|--|-------------------------|
| Duration | 2012-2020 |
| Total Implementation Cost (NIS) | 50,000 NIS |
| Annual Energy Savings (MWh) | 23.88 MWh |
| Annual Emission Reduction (tn CO ₂) | 6.11 tn CO ₂ |
| Funding Source | Own funds |
| Net Present Value (NPV) | 23,000 NIS |

3.7.3 Municipal fleet maintenance

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 74 below.

Table 74 - Action 6.3 in numbers

| Action 6.3: Municipal fleet maintenance | |
|--|--------------------------|
| Duration | 2013-2020 |
| Total Implementation Cost (NIS) | 220,000 NIS |
| Annual Energy Savings (MWh) | 77.60 MWh |
| Annual Emission Reduction (tn CO₂) | 19.85 tn CO ₂ |
| Funding Source | Own funds |
| Net Present Value (NPV) | 19,500 NIS |

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 75 below. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 75 - 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) | 50,000 NIS |
| Annual Energy Savings (MWh) | 119.39 MWh |
| Annual Emission Reduction (tn CO₂) | 30.54 tn CO ₂ |
| Funding Source | Own funds + Gov. (Min. of Energy, Transportation, Environment) |
| Net Present Value (NPV) | 320,000 NIS |

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 76. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 76 - 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 Mobilised (NIS) | 185,000,000 NIS |
| Annual Energy Savings (MWh) | 34,509.68 MWh |
| Annual Emission Reduction (tn CO2) | 8,942.05 tn CO2 |
| Funding Source | Own funds + 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 CO₂ 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 77 - Action 6.6 in numbers

| Action 6.6: Transportation master plan | |
|---|--|
| Duration | 2016-2017 |
| Total Implementation Cost (NIS) | 550,000 NIS |
| Funding Source | Own funds + Ministry of Transportation |

3.7.7 Improve public transportation

Although public transportation is relatively good in the municipality of Ramla, there is always room for improvement.

The master plan intends to identify all the routes that are not adequately serviced so far, in order either to establish new bus routes, or 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. Additional modifications to increase the transit possibilities for workers will be realized according to the master plan suggestions.

The public transportation in Ramla is conducted through private companies; however, the municipality intends to begin dialogue with them in order to ensure their collaboration in this initiative.

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

Table 78 - Action 6.7 in numbers

| Action 6.7: Improve public transportation | |
|--|----------------------------|
| Duration | 2013-2017 |
| Total Implementation Cost (NIS) | 50,000 NIS |
| Annual Energy Savings (MWh) | 16,548.88 MWh |
| Annual Emission Reduction (tn CO2) | 4,120.67 tn CO2 |
| Funding Source | Ministry of Transportation |
| 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 Ramla 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) of 10 km across the road network of Ramla.
- 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 79. The derived benefits from the action cannot be measured only in terms of economic profit for the municipality, since the action contributes to the improvement of quality of life.

This action constitutes a priority for the municipality, and for this reason is further developed as project fiche.

Table 79 - Action 6.8 in numbers

| Action 6.8: Cycling promotion and creation of related infrastructure | |
|---|---|
| Duration | 2016-2030 |
| Total Implementation Cost (NIS) | 10,750,000 NIS |
| Annual Energy Savings (MWh) | 6,895.00 MWh |
| Annual Emission Reduction (tn CO2) | 1,717.00 tn CO2 |
| Annual Emission Reduction (tn CO2) by 2020 | 500.00 tn CO2 |
| Funding Source | EU + Gov. (Min. 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 way for citizens' mobility within a community, and especially a relatively small one like Ramla. This action is focused on a different 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.

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.

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 match 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 80.

Table 80 - 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) | 11,032.59 MWh |
| Annual Emission Reduction (tn CO2) | 2,747.11 tn CO2 |
| Funding Source | EU + Gov. (Min. of Transportation, Energy, Environment) |
| Net Present Value (NPV) | < 0 |

3.7.10 Improvement/ development of parking infrastructure

Car congestion, as well as decreased transiting ability to the means of public transportation, are common problems the drivers face due to the inability to find a parking space.

In an effort to decrease the time and fuel spent by the drivers in their attempt to find a parking space and the limited use of the means of public transportation due to the lack of parking lots to facilitate transiting passengers, the municipality of Ramla intends to improve/extend the existing parking

infrastructure and develop new ones where required. More specifically, the plan is to develop large parking lots in the outskirts of the centre, and have municipal shuttles to the centre and the industrial centre.

These parking spaces could be available for the public at relatively low prices.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 81.

Table 81 - Action 6.10 in numbers

| Action 6.10: Improvement/ development of parking infrastructure | |
|---|--|
| Duration | 2017-2020 |
| Total Implementation Cost (NIS) | 12,000,000 NIS |
| Annual Energy Savings (MWh) | 12,411.66 MWh |
| Annual Emission Reduction (tn CO2) | 3,090.50 tn CO2 |
| Funding Source | IFIs + Gov. (Min. of Transportation, Energy, Building) |
| Net Present Value (NPV) | |

3.7.11 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 cities 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.

In the Municipality of Ramla, a pilot project has been implemented by the Ministry of Transport. Several bus stations have been upgraded with real time electronic boards. It is the intention of the Municipality to install real time information boards in all bus stations, in order to encourage the citizens to use the public transport in their daily time scheduled activities.

Related calculations on the action in terms of initial cost, energy and emission savings, as well as financial viability, are presented in Table 82.

Table 82 - Action 6.11 in numbers

| Action 6.11: Adoption of real time information in public transport | |
|--|--|
| Duration | 2013-2017 |
| Total Implementation Cost (NIS) | 450,000 NIS |
| Annual Energy Savings (MWh) | 4,137.22 MWh |
| Annual Emission Reduction (tn CO2) | 1,030.17 tn CO2 |
| Funding Source | Own sources + Ministry of Transportation |
| Net Present Value (NPV) | >0 |

3.7.12 Promotion of eco-driving

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 up to 20% directly after training and about 5% in the long run.

Based on these facts, the municipality of Ramla intends to realise a series of seminars targeted at the private transport professionals in Ramla. The seminars will initially address 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 Ramla, 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 83. As an awareness raising activity, it is considered that the action is exponentially beneficial to the municipality against the related costs.

Table 83 - Action 6.12 in numbers

| Action 6.12: Promotion of eco-driving | |
|--|--|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 550,000 NIS |
| Annual Energy Savings (MWh) | 8,797.48 MWh |
| Annual Emission Reduction (tn CO₂) | 2,322.81 tn CO ₂ |
| Funding Source | Own sources + Gov. (Min. of Transportation, Energy, Environment) |
| Net Present Value (NPV) | > 0 |

3.7.13 Promotion of new technology buses in the public transportation

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

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 84.

Table 84 - Action 6.13 in numbers

| Action 6.13: Promotion of new technology buses in the public transportation | |
|--|-----------------------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | - |
| Expected Private Funds Mobilized (NIS) | 189,000,000 NIS |
| Annual Energy Savings (MWh) | 3,977.22 MWh |
| Annual Emission Reduction (tn CO₂) | 1,061.92 tn CO ₂ |

3.7.14 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 3.5% fuel savings.

Related calculations on the action in terms of initial cost and emission savings are presented in Table 85.

Table 85 - Action 6.14 in numbers

| Action 6.14: Traffic congestion reduction through adoption of different timing of activities | |
|---|--|
| Duration | 2017-2020 |
| Total Implementation Cost (NIS) | 500,000 NIS |
| Annual Energy Savings (MWh) | 30,619.84 MWh |
| Annual Emission Reduction (tn CO2) | 3,299.23 tn CO2 |
| Funding Source | Own funds + Gov. (Min. of Energy, Transportation, Education) |
| Net Present Value (NPV) | > 0 |

3.8 Agriculture

The agricultural sector in Ramla has a very small footprint on the total emissions, with less than 0.5% of the total CO₂ emissions of the municipality.

Table 86 – Proposed actions for Agriculture

| Action No | Action | Emission Reductions (tn CO2) |
|------------------|------------------------------|-------------------------------------|
| 7.1 | Awareness raising activities | 164.38 |

3.1.1 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 87.

Table 87 - Action 7.1 in numbers

| Action 7.1: Awareness raising activities | |
|---|---------------|
| Duration | 2016-2020 |
| Total Implementation Cost (NIS) | 50,000 NIS |
| Annual Energy Savings (MWh) | 252.89 MWh |
| Annual Emission Reduction (tn CO2) | 151.73 tn CO2 |
| Funding Source | Own funds |
| 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 88 - 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 | <ul style="list-style-type: none"> Number of devices that were bought with green procurement procedures | <ul style="list-style-type: none"> Device number |
| 1.2 | Upgrade of the municipal buildings' and facilities' lighting system | <ul style="list-style-type: none"> Number of lamps that were replaced with LED lamps Area covered with automations in lighting | <ul style="list-style-type: none"> Number of lamps replaced each year m² |
| 1.3 | LED lighting in new municipal projects | <ul style="list-style-type: none"> Number of new projects with LED lighting Total kW of LED lighting installed | <ul style="list-style-type: none"> Number of projects kW |
| 1.4 | Upgrade of the municipal buildings' and facilities' A/C systems | <ul style="list-style-type: none"> Number of A/Cs that were replaced with more efficient | <ul style="list-style-type: none"> Number of A/Cs |
| 1.5 | Installation of automations in municipal buildings and facilities | <ul style="list-style-type: none"> Area covered with automations | <ul style="list-style-type: none"> m² |
| 1.6 | Energy Manager appointment in the Municipality | <ul style="list-style-type: none"> Number of years that the Energy Manager is appointed and active Number and % of municipal infrastructure under his supervision | <ul style="list-style-type: none"> Number of years Number and % of municipal infrastructure being supervised |
| 1.7 | Awareness raising activities for municipal employees | <ul style="list-style-type: none"> Number of training seminars that were implemented Municipal employees that were trained | <ul style="list-style-type: none"> Number of seminars Number of employees |
| 1.8 | Shadings' installation in the municipal buildings' southern façade | <ul style="list-style-type: none"> Area of shadings installed Average temperature in the buildings | <ul style="list-style-type: none"> m² °C |
| 1.9 | The 10% commitment campaign for schools | <ul style="list-style-type: none"> Total energy consumption in schools Average consumption per m² in each school Savings achieved per participating school in kWh and % | <ul style="list-style-type: none"> kWh kWh/m² kWh and % |
| 1.10 | Awareness raising campaigns for pupils/ students | <ul style="list-style-type: none"> Number of campaigns that were implemented Students that were reached from the campaigns | <ul style="list-style-type: none"> Number of campaigns Number of students |
| 1.11 | Increase of natural lighting in municipal buildings | <ul style="list-style-type: none"> Area covered with natural lighting | <ul style="list-style-type: none"> m² |
| 1.12 | Use of cool colours on municipal buildings and facilities' | <ul style="list-style-type: none"> Area covered with cool colours | <ul style="list-style-type: none"> m² |

| Action No | Action | Key Performance Indicators | Measurement units |
|----------------------------------|---|--|--|
| | roofs | <ul style="list-style-type: none"> Average temperature in the buildings | <ul style="list-style-type: none"> °C |
| 1.13 | Promotion of recycling | <ul style="list-style-type: none"> Total amount of recycled waste in the Municipality Total actions that were implemented to promote recycling Available infrastructure in terms of recycle bins coverage | <ul style="list-style-type: none"> tn/year Number of seminars, leaflets and other actions Number of recycle bins per square km area |
| 1.14 | Awareness raising campaigns to reduce the amounts of discarded food (reduction of the organic content of waste) | <ul style="list-style-type: none"> Total amount of discarded food Total actions implemented to raise awareness | <ul style="list-style-type: none"> tn/year Number of workshops, seminars, leaflets etc. |
| 1.15 | Installation of 2 MW PVs in municipal buildings' rooftops | <ul style="list-style-type: none"> Installed capacity of PV on roofs Percentage of installed capacity compared to the initial target | <ul style="list-style-type: none"> MWp % out of 2 MWp |
| 1.16 | Construction of a municipal green building as demonstration project | <ul style="list-style-type: none"> Installed capacity of PV on roofs Percentage of installed capacity compared to the initial target | <ul style="list-style-type: none"> kWp % out of 700kWp |
| Municipal public lighting | | | |
| 2.1 | Municipal lighting study | <ul style="list-style-type: none"> Lighting study implementation | <ul style="list-style-type: none"> YES/NO answer |
| 2.2 | Municipal lighting system upgrade | <ul style="list-style-type: none"> Lamps that were replaced with energy efficient MWh produced from PVs installed on lighting poles % of lighting grid covered by automations | <ul style="list-style-type: none"> Number of lamps MWh % |
| 2.3 | Solar street lighting signs | <ul style="list-style-type: none"> Number of signs replaced with solar lighting signs Area covered by solar street lighting signs | <ul style="list-style-type: none"> Number of signs m² |
| 2.4 | Upgrading traffic lights | <ul style="list-style-type: none"> Number of traffic lights replaced with LED | <ul style="list-style-type: none"> Number of lights |
| Residential buildings | | | |
| 3.1 | The 10% voluntary commitment campaign | <ul style="list-style-type: none"> Total energy consumption in houses Average consumption per m² in residential sector | <ul style="list-style-type: none"> kWh kWh/m² |
| 3.2 | Promotion of Green Buildings' concept | <ul style="list-style-type: none"> Number of buildings that were refurbished to become 'Green' Number of promotion actions and average | <ul style="list-style-type: none"> Number of buildings Number of seminars, leaflets etc. |

| Action No | Action | Key Performance Indicators | Measurement units |
|---|---|--|---|
| | | attendance | <ul style="list-style-type: none"> • People attended each action |
| 3.3 | Campaign for old fridges, A/Cs and lamps | <ul style="list-style-type: none"> • Number of old fridges that were replaced with new and more efficient • Number of lamps that were replaced with LED lamps • Number of A/Cs that were replaced with new ones | <ul style="list-style-type: none"> • Number of fridges • Number of lamps replaced each year • Number of A/Cs |
| 3.4 | Information & awareness raising activities | <ul style="list-style-type: none"> • Number of awareness raising seminars and information days • Attendants in each event | <ul style="list-style-type: none"> • Number of activities • People attended each event |
| 3.5 | Initiatives supporting citizens' actions | <ul style="list-style-type: none"> • Number of actions implemented • Attendants in each event | <ul style="list-style-type: none"> • Number of actions • People attended each action |
| 3.6 | Establishment of the municipal team | <ul style="list-style-type: none"> • Number of people that were consulted by the municipal team | <ul style="list-style-type: none"> • Number of people |
| 3.7 | 6 MW Photovoltaics in residential rooftops | <ul style="list-style-type: none"> • Installed capacity of PV on roofs • Percentage of installed capacity compared to the initial target | <ul style="list-style-type: none"> • kWp • % out of 6 MWp |
| 3.8 | Voluntary agreement with Building Constructors to promote green building concepts | <ul style="list-style-type: none"> • Number of new green buildings constructed • Number of building constructors involved | <ul style="list-style-type: none"> • Number of buildings • Number of building constructors |
| 3.9 | Awareness raising activities for the residential buildings' associations | <ul style="list-style-type: none"> • Number of associations attending the activities • % of residential buildings' associations involved | <ul style="list-style-type: none"> • Number of associations • % of associations |
| Commercial Buildings, Equipment / Facilities | | | |
| 4.1 | Seminars to professional groups | <ul style="list-style-type: none"> • Number of awareness raising seminars • Attendants in each event | <ul style="list-style-type: none"> • Number of activities • People attended each activity |
| 4.2 | On-going training to professional groups | <ul style="list-style-type: none"> • Number of professionals involved in the training sessions • Percentage of professionals covered. | <ul style="list-style-type: none"> • Number of professionals • % of professionals |
| 4.3 | 10% voluntary commitment campaign | <ul style="list-style-type: none"> • Total energy consumption | <ul style="list-style-type: none"> • kWh |

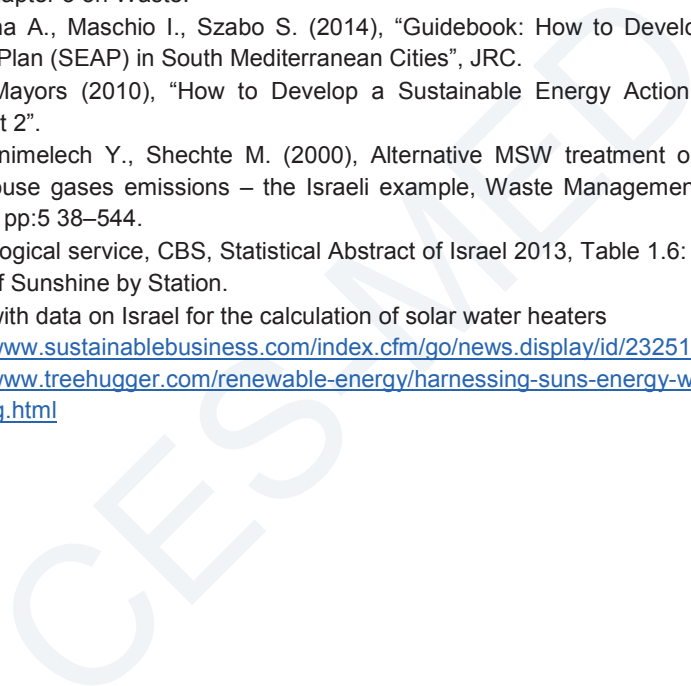
| Action No | Action | Key Performance Indicators | Measurement units |
|--------------------------|---|--|---|
| | | <ul style="list-style-type: none"> Average consumption per m² in commercial sector | <ul style="list-style-type: none"> kWh/m² |
| 4.4 | Promotion of green buildings' concept | <ul style="list-style-type: none"> Number of buildings that were refurbished to become 'Green' Number of promotion actions and average attendance | <ul style="list-style-type: none"> Number of buildings Number of seminars, leaflets etc. People attended each action |
| 4.5 | Other information and awareness raising activities | <ul style="list-style-type: none"> Number of leaflets, brochures etc. distributed People reached | <ul style="list-style-type: none"> Number of leaflets, brochures etc. Number of people reached |
| 4.6 | 12 MW photovoltaic panels on building rooftops | <ul style="list-style-type: none"> Installed capacity of PV on roofs Percentage of installed capacity compared to the initial target | <ul style="list-style-type: none"> kWp % out of 12 MWp |
| Industrial Sector | | | |
| 5.1 | Subsidized energy audits at a volunteer basis | <ul style="list-style-type: none"> Audits implemented at Industrial Facilities Measures taken by the industries that were audited | <ul style="list-style-type: none"> Number of audits Number of Measures |
| 5.2 | Targeted training seminars | <ul style="list-style-type: none"> Number of training seminars Attendants in each event | <ul style="list-style-type: none"> Number of seminars People attended each seminar |
| 5.3 | 10% voluntary commitment campaign | <ul style="list-style-type: none"> Total energy consumption Average consumption per m² in industrial sector | <ul style="list-style-type: none"> kWh kWh/m² |
| 5.4 | On-going training provision | <ul style="list-style-type: none"> Number of stakeholders involved Number of events organised | <ul style="list-style-type: none"> Number of stakeholders Number of events |
| 5.5 | Switch to "cleaner" electricity provider | <ul style="list-style-type: none"> Number of industrial consumers that switched to new "cleaner" electricity providers kWh / year that are produced by "cleaner" providers | <ul style="list-style-type: none"> Number of customers kWh / year |
| Transport | | | |
| 6.1 | Replacement of the municipal vehicles with new and more efficient | <ul style="list-style-type: none"> Number of vehicles replaced Fuel saved at an annual basis | <ul style="list-style-type: none"> Number of vehicles It of Gasoline and Diesel |

| Action No | Action | Key Performance Indicators | Measurement units |
|-----------|---|--|--|
| 6.2 | Efficient management of the municipal fleet | <ul style="list-style-type: none"> Total distance covered by municipal vehicles per year % of distance reduction at an annual basis | <ul style="list-style-type: none"> km % of total km reduced |
| 6.3 | Maintenance of the municipal fleet | <ul style="list-style-type: none"> Number of cars maintained Fuel saved at an annual basis | <ul style="list-style-type: none"> Number of cars lt of Gasoline and Diesel |
| 6.4 | Eco-driving seminars for the municipal fleet's drivers | <ul style="list-style-type: none"> Number of seminars implemented Percentage of drivers that attended the seminars | <ul style="list-style-type: none"> Number of seminars % out of total number of drivers |
| 6.5 | Awareness raising on new vehicle technologies | <ul style="list-style-type: none"> Number of awareness raising seminars Attendants in each event New vehicle purchases per year | <ul style="list-style-type: none"> Number of activities People attended each activity Number of vehicles |
| 6.6 | Transportation master plan | <ul style="list-style-type: none"> Implementation of the transportation plan Percentage of the city area covered by the public transport | <ul style="list-style-type: none"> YES/NO % in total area |
| 6.7 | Improve public transportation | <ul style="list-style-type: none"> Number of routes that included more buses Number of routes that were changed | <ul style="list-style-type: none"> Number of routes Number of routes |
| 6.8 | Cycling promotion and creation of related infrastructure | <ul style="list-style-type: none"> Total area of cycling roads constructed Total bicycle parking areas constructed | <ul style="list-style-type: none"> m² Number of bicycle parking areas |
| 6.9 | Promotion of walking, car sharing and car pooling campaigns | <ul style="list-style-type: none"> Area of pavements constructed/refurbished Number of walking signs installed Number of parks etc. renovated Number of awareness raising activities | <ul style="list-style-type: none"> m² Number of signs Number of public areas Number of activities |
| 6.10 | Improvement / development of parking infrastructure | <ul style="list-style-type: none"> Area of parking lots constructed Number of cars parked at the new lots at an annual basis | <ul style="list-style-type: none"> m² Number of cars |
| 6.11 | Adoption of real time information in public transport | <ul style="list-style-type: none"> Number of e-signs installed Number of passengers in each route | <ul style="list-style-type: none"> Number of signs Number of people |
| 6.12 | Promotion of eco-driving | <ul style="list-style-type: none"> Number of seminars implemented Percentage of drivers that attended the seminars | <ul style="list-style-type: none"> Number of seminars % out of total number of drivers |

| Action No | Action | Key Performance Indicators | Measurement units |
|--------------------|---|--|---|
| 6.13 | Promotion of new technology buses in the public transportation | <ul style="list-style-type: none"> Number of buses replaced with new | <ul style="list-style-type: none"> Number of buses |
| 6.14 | Traffic congestion reduction through adoption of different timing of activities | <ul style="list-style-type: none"> Number of Municipal services that changed operation schedules Average % of traffic congestion hours per day | <ul style="list-style-type: none"> Number of services % of day |
| Agriculture | | | |
| 7.1 | Awareness raising activities | <ul style="list-style-type: none"> Number of awareness raising seminars Attendants in each event | <ul style="list-style-type: none"> Number of activities People attended each activity |

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ANNEXES

CES-MED



ANNEX A – Consumption of Educational Buildings

| Site Name | No | Annual Energy Consumption (kWh) |
|--------------------|------------------|---------------------------------|
| High Schools | 1 | 61,420 |
| | 2 | 78,500 |
| | 3 | 161,350 |
| | 4 | 228,078 |
| | 5 | 152,906 |
| | 6 | 78,000 |
| | 7 | 230,000 |
| | TOTAL | 990,254 |
| Middle Schools | 1 | 132,400 |
| | 2 | 127,830 |
| | 3 | 139,772 |
| | TOTAL | 400,002 |
| Elementary schools | 1 | 83,000 |
| | 2 | 71,862 |
| | 3 | 117,200 |
| | 4 | 85,950 |
| | 5 | 95,780 |
| | 6 | 65,120 |
| | 7 | 110,119 |
| | 8 | 115,620 |
| | 9 | 31,904 |
| | 10 | 174,858 |
| | 11 | 81,978 |
| | 12 | 76,222 |
| | 13 | 29,400 |
| | 14 | 148,290 |
| | 15 | 92,116 |
| | 16 | 144,278 |
| TOTAL | 1,523,697 | |
| Preschools | 1 | 15,390 |
| | 2 | 14,499 |
| | 3 | 11,084 |
| | 4 | 13,434 |
| | 5 | 6,225 |
| | 6 | 14,138 |
| | 7 | 14,151 |
| | 8 | 19,557 |
| | 9 | 14,408 |
| | 10 | 8,307 |
| | 11 | 5,841 |
| | 12 | 6,489 |
| | 13 | 6,669 |
| | 14 | 7,929 |
| 15 | 8,042 | |
| 16 | 5,492 | |
| 17 | 5,567 | |
| 18 | 4,885 | |
| 19 | 12,296 | |
| 20 | 14,073 | |

| Site Name | No | Annual Energy Consumption (kWh) |
|--------------------|--------------|---------------------------------|
| | 21 | 7,844 |
| | 22 | 5,574 |
| | 23 | 7,271 |
| | 24 | 12,525 |
| | 25 | 8,224 |
| | 26 | 13,099 |
| | 27 | 3,927 |
| | 28 | 9,194 |
| | 29 | 9,311 |
| | 30 | 7,119 |
| | 31 | 7,411 |
| | 32 | 5,699 |
| | 33 | 10,522 |
| | 34 | 13,500 |
| | 35 | 5,609 |
| | 36 | 13,690 |
| | 37 | 11,463 |
| | 38 | 3,815 |
| | 39 | 7,844 |
| | 40 | 14,001 |
| | 41 | 12,378 |
| | 42 | 5,643 |
| | 43 | 11,382 |
| | 44 | 11,672 |
| | 45 | 9,177 |
| | 46 | 15,104 |
| | 47 | 11,397 |
| | 48 | 6,060 |
| | 49 | 8,491 |
| | 50 | 11,701 |
| | 51 | 11,368 |
| | 52 | 13,646 |
| | 53 | 18,119 |
| | 54 | 3,493 |
| | TOTAL | 535,749 |
| All Schools | TOTAL | 3,449,702 |

ANNEX B – Municipal Transport Data

| Car Type | Annual Oil Consumption (litres) | Fuel Type |
|--------------------|---------------------------------|-------------|
| Commercial Vehicle | 3,148 | Diesel |
| Truck | 1,137 | |
| Commercial Vehicle | 1,190 | |
| Commercial Vehicle | 1,276 | |
| Commercial Vehicle | 459 | |
| Passenger Vehicle | 86 | |
| Passenger Vehicle | 804 | |
| Commercial Vehicle | 6,477 | |
| Passenger Vehicle | 2,367 | |
| Passenger Vehicle | 1,443 | |
| Passenger Vehicle | 3,156 | |
| Passenger Vehicle | 1,601 | |
| Passenger Vehicle | 1,309 | |
| Passenger Vehicle | 1,005 | |
| Passenger Vehicle | 1,439 | |
| Passenger Vehicle | 2,552 | |
| Commercial Vehicle | 703 | |
| Commercial Vehicle | 1,204 | |
| Commercial Vehicle | 1,362 | |
| Truck | 2,180 | |
| Commercial Vehicle | 590 | |
| Passenger Vehicle | 1,621 | |
| Passenger Vehicle | 4,007 | |
| Passenger Vehicle | 1,433 | |
| Passenger Vehicle | 3,059 | |
| Passenger Vehicle | 3,120 | |
| Passenger Vehicle | 2,266 | |
| Passenger Vehicle | 1,694 | |
| Passenger Vehicle | 1,211 | |
| Passenger Vehicle | 3,377 | |
| Passenger Vehicle | 2,274 | |
| Passenger Vehicle | 2,700 | |
| Passenger Vehicle | 1,008 | |
| Passenger Vehicle | 1,877 | |
| Passenger Vehicle | 2,376 | |
| Passenger Vehicle | 2,741 | |
| Passenger Vehicle | 2,560 | |
| Passenger Vehicle | 317 | |
| Passenger Vehicle | 301 | |
| Passenger Vehicle | 212 | |
| Passenger Vehicle | 183 | |
| Passenger Vehicle | 258 | |
| Passenger Vehicle | 316 | |
| Passenger Vehicle | 307 | |
| Passenger Vehicle | 2,202 | |
| Passenger Vehicle | 190 | |
| Passenger Vehicle | 1,412 | |
| Passenger Vehicle | 37 | |
| Passenger Vehicle | 1,711 | |
| Passenger Vehicle | 2,589 | |
| Passenger Vehicle | 9,199 | |
| | | Gasoline 95 |

| Car Type | Annual Oil Consumption (litres) | Fuel Type |
|-------------------|---------------------------------|-----------|
| Passenger Vehicle | 2,509 | |
| Passenger Vehicle | 2,398 | |
| Passenger Vehicle | 1,041 | |
| Passenger Vehicle | 1,102 | |

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ANNEX C – Public Transport Data

| Bus Line Number | Route Distance Travelled Within LA (km) | Routes / Year | Annual Distance Travelled Within LA (km) |
|-----------------|---|---------------|--|
| 4 | 6.14 | 16,530 | 101,494.20 |
| 5 | 11.91 | 19,380 | 230,815.80 |
| 7 | 9.37 | 11,115 | 104,147.55 |
| 8 | 5.42 | 15,390 | 83,413.80 |
| 10 | 6.15 | 2,280 | 14,022.00 |
| 11 | 4.63 | 8,265 | 38,266.95 |
| 12 | 2.74 | 4,560 | 12,494.40 |
| 13 | 5.70 | 17,955 | 102,343.50 |
| 15 | 4.61 | 13,680 | 63,064.80 |
| 16 | 2.27 | 3,420 | 7,763.40 |
| 18 | 2.27 | 3,990 | 9,057.30 |
| 24 | 2.27 | 2,280 | 5,175.60 |
| 26 | 2.27 | 2,280 | 5,175.60 |
| 27 | 2.29 | 855 | 1,957.95 |
| 28 | 2.29 | 11,970 | 27,411.30 |
| 29 | 2.29 | 1,710 | 3,915.90 |
| 30 | 7.94 | 1,425 | 11,314.50 |
| 51 | 4.33 | 285 | 1,234.05 |
| 53 | 6.04 | 1,140 | 6,885.60 |
| 55 | 6.50 | 570 | 3,705.00 |
| 56 | 6.68 | 1,710 | 11,422.80 |
| 139 | 2.23 | 285 | 635.55 |
| 144 | 3.77 | 1,710 | 6,446.70 |
| 150 | 2.69 | 24,225 | 65,165.25 |
| 152 | 3.53 | 3,420 | 12,072.60 |
| 153 | 2.08 | 570 | 1,185.60 |
| 154 | 4.81 | 2,850 | 13,708.50 |
| 158 | 1.35 | 285 | 384.75 |
| 159 a | 0.44 | 5,415 | 2,382.60 |
| 159 b | 3.24 | 285 | 923.40 |
| 174 | 5.64 | 570 | 3,214.80 |
| 239 | 2.57 | 5,985 | 15,381.45 |
| 244 | 2.57 | 3,705 | 9,521.85 |
| 244 b | 2.60 | 3,705 | 9,633.00 |
| 245 | 5.62 | 5,700 | 32,034.00 |
| 247 | 6.74 | 20,805 | 140,225.70 |
| 248 | 4.67 | 570 | 2,661.90 |
| 249 | 4.67 | 19,380 | 90,504.60 |
| 251 | 4.67 | 1,140 | 5,323.80 |
| 293 | 2.57 | 570 | 1,464.90 |
| 354 | 3.83 | 1,140 | 4,366.20 |
| 403 | 2.50 | 3,990 | 9,975.00 |
| 404 | 4.43 | 2,850 | 12,625.50 |
| 411 | 4.67 | 11,685 | 54,568.95 |
| 432 | 4.43 | 2,850 | 12,625.50 |
| 433 | 4.67 | 11,115 | 51,907.05 |
| 435 | 4.43 | 570 | 2,525.10 |
| 450 | 6.15 | 8,265 | 50,829.75 |
| 451 | 4.82 | 23,940 | 115,390.80 |
| 451 b | 4.43 | 570 | 2,525.10 |

| Bus Line Number | Route Distance Travelled Within LA (km) | Routes / Year | Annual Distance Travelled Within LA (km) |
|-----------------|---|---------------|--|
| 452 | 3.90 | 285 | 1,111.50 |
| 454 | 6.52 | 4,560 | 29,731.20 |
| 455 | 3.07 | 3,135 | 9,624.45 |
| 457 | 2.95 | 3,705 | 10,929.75 |
| 458 | 5.77 | 1,710 | 9,866.70 |
| 461 | 1.36 | 30,210 | 41,085.60 |
| 548 | 4.27 | 570 | 2,433.90 |
| TOTAL | | | 1,680,075.00 |

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ANNEX D – Project Fiches

CES-MED



Upgrading of the municipal buildings' AC facilities - # No 1

1. General Presentation

| Location | Start date | Project Lifetime |
|---|------------|------------------|
| Ramla municipal buildings | 2016 | 5 years |
| Project Owner / Lead Actor | | |
| Municipality of Ramla | | |
| Contact person | | |
| Mr. Alon Shemesh – head of Electricity department | | |



Summary of the Action

Due to the geographical position and climatic characteristics of Israel, the country is often experiencing high temperatures for long periods of time. Maintaining adequate internal conditions in the buildings requires high air conditioning loads and electricity consumption.

According to the National Energy Efficiency Program Reducing Electricity Consumption 2010-2020 study, by the Ministry of National Infrastructures, there are three main courses of action that should be undertaken in order to manifest the efficiency programs in the local authorities' sector: Support incentives for the upgrade of lighting systems, air-conditioning systems, and thermal treatment of roofs.

Electricity consumption by acclimatization systems (cooling and heating) comprises about 40% of local authorities' energy consumption, and about 50-60% of the energy consumed in buildings. In line with the same study, the efficiency potential of air-conditioning systems is estimated at about 20%.

Therefore, in line to the governmental planning, municipal buildings not only constitute one of the ideal test buildings for applying this solution in terms of demonstration purposes to the citizens, but will also be able to achieve some budget cuts and save money for the municipality. A gradual replacement of the buildings' air conditioning units with more efficient ones is foreseen under this action in selected buildings among the 100 facilities of the local authority.

In this respect, an initial draft audit will be realized in the 100 buildings of the municipality in order to register the existing systems being used in each facility, as well as the models and the years in operation. Following this, the respective decisions will be made on which equipment will be replaced. Of course, priority will be given to the substitution of the most inefficient equipment, and the buildings with the heaviest cooling loads.

In this action it is considered that the replacement of the ACs will contribute with a 25% reduction of the cooling loads (approximately 15% of the overall electricity consumption). The action will be gradually applied in all the municipal buildings.

The suggested solution is expected to create an annual saving of 570,000 NIS in the municipal budget. The estimated total cost of the investment, covering the initial draft energy audit, the equipment and the labour is calculated at 4,000,000 NIS and it is expected to reduce the energy consumption by 1,250 MWh.

| | | | | | |
|--|---|--|--|----------------------|---------------------------|
| General Objectives of the Project | | Principal partners and stakeholders | | | |
| 1. Reduce the municipality's electricity bills. 2. Reduction of the carbon footprint from the municipal sector | | 1. Electricity department and SEAP team of Ramla Municipality 2. 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. Ramla municipal authority | | 1. This action has been proposed as part of the municipality's SEAP in the municipal sector. 2. The action is fully coordinated with the National Energy Efficiency Program | | | |
| Estimated investment cost needed | | | | | |
| EUR: | 950,000 | | | | |
| NIS: | 4,000,000 | | | | |
| 2. Technical Description | | | | | |
| Area(s) of intervention (sectors as specified in the SEAP proposed by CoM) | | | Main adopted Technology & Equipment | | |
| Municipal buildings | | | The technology of AC inverters of high energy class is internationally widely acknowledged and proven. | | |
| Site / Place | | Status of the action | | | |
| The action focuses on all the municipal buildings (100 in total) | | 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, since the technology is relatively easy to apply, no in depth studies are needed as well. | | | |
| Engineering Studies | Draft energy audit of the existing systems needs to take place | | | | |
| Implementation plan / Construction plan | The technology is relatively easy to apply. The implementation plan is to have it gradually implemented by the end of 2020. | | | | |
| Other previous | Not available | | | | |
| Environmental impact assessment | Not available, although the expected impact can only be considered positive for this 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. | | |

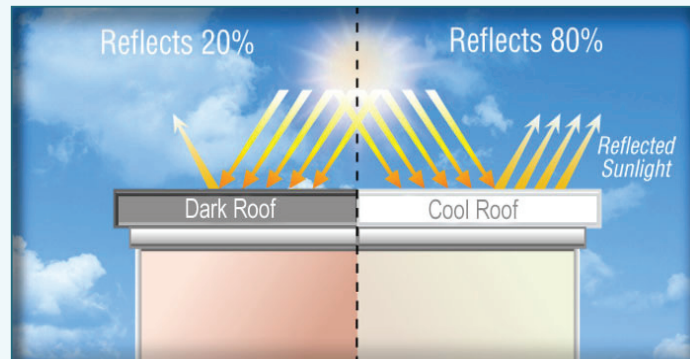
| Staff allocated to prepare, implement and monitor the action | | Municipal / City Staff Training Needs | | |
|--|---|---|--|--|
| The engagement of 2 persons from the municipality's personnel for the implementation of the draft energy audit and the prioritization of the systems' replacement for a period of 3 months is envisaged. Tendering the work and overseeing the tenderer's progress in a period of 3-4 years is envisaged that can be realized by the existing personnel. | | No training needs are envisaged for this action | | |
| Technical Assistance Needs | | Role of Partners | | |
| No technical assistance is required, since the municipal personnel has the capacity of conducting a draft energy audit and registration of the existing equipment. | | <ul style="list-style-type: none"> The electricity department and SEAP team will have a role in the selection of the priority buildings and the monitoring of the action, perhaps through meetings every second week. The Ministry of National Infrastructures, Energy and Water can provide financing for the action | | |
| 4. Cost Estimates | | | | |
| Initial and start-up expenses | EUR: 950,000 | Net Present Value (NPV) | Return of Investment (IRR) | |
| | NIS: 4,000,000 | | | |
| Operational Costs (approx.) | EUR: 0,0 | EUR: 465,000 | The NPV has been calculated for an average life span of fifteen years, with an I = 5%. The whole investment is considered to be conducted within 2016. | |
| | NIS: 0,0 | | | |
| Annual Income (approx.) | EUR: 135,700 | NIS: 1,950,000 | | |
| | NIS: 570,000 | | | |
| 5. Funding Sources | | | | |
| Funding Source | Fund | | | |
| Local Authority's own resources | Contribution up to 10% of the project's initial cost | | | |
| National Funds and Programs | Ministry of National Infrastructure, Energy and Water resources | | | |
| 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 | 450,000 NIS at an annual basis that can be used for a loan or a contract with an ESCO | | | |

| | |
|---|--|
| Other | |
| 6. Projected Energy Estimates in 2020 | |
| Energy Savings (MWh/a) | Renewable Energy Production (MWh/a) |
| 1,250 | N/A |
| CO₂ Reduction (tn CO₂/a) | |
| Target Year | 2020 |
| Net reduction on the Territory | 690 |
| Reduction as related to BAU Scenario | 0.3% |
| Per Capita calculated reduction | 17 kg CO ₂ |
| 7. Summary of Related Awareness Raising (AR) Actions | |
| Awareness Raising related to the Action | |
| <p>Although the action is not an awareness related one, certain awareness raising activities on the achieved results, in order to showcase the potential savings in terms of energy, as well as municipal resources will be realized. Presentations to other municipalities, circulation of a newsletter and contacts with the national authorities will be conducted.</p> | |
| Awareness raising related to the Community | |
| <p>The results of the action will be also communicated to the residents through the social media. Moreover, since it will be realized in municipal buildings where the citizens gather or visit regularly (schools, athletic facilities, municipal services), the addition of a small sign in each building's entrance, 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.), could be added. Alternatively a QR code for smart phones with the required explanations could be added.</p> | |
| 8. Assumptions and risks | |
| <p>The technology is proven and no risks related to its use are identified. The respective assumptions and calculations have been based on national averages and data available by the municipality. A draft energy audit of the facilities is considered to provide the necessary data in order to minimize the related risks. This action should be accompanied with capacity building of the personnel in order to demonstrate the need for the correct use of the equipment (e.g. putting the thermostat at 22 degrees Celsius and not higher or lower), since it is very frequent the phenomenon that the foreseen energy savings are not achieved due to misperceptions of the users.</p> | |
| 9. Key Success Factors | |
| <p>Frequent maintenance of the ACs in order to maintain their performance. Monitoring of the achieved savings and identification of any variations from the envisaged consumptions.</p> | |
| 10. Next Steps | |
| <p>Implementation of draft energy audit. Selection of the most energy consuming buildings, with high cooling needs.</p> | |
| 11. Annexes / References to Annexes | |
| - | |

Use of cool colours in municipal roofs - # No 2

1. General Presentation

| Location | Start date | Project Lifetime |
|---|------------|------------------|
| Ramla municipal buildings | 2016 | 2 years |
| Project Owner / Lead Actor | | |
| Municipality of Ramla | | |
| Contact person | | |
| Ms. Sharon Etner - head of Environment wing Ms. Jana Soloveichik – vice city's | | |



Summary of the Action

Due to the geographical position and climatic characteristics of Israel, the country is often experiencing high temperatures for long periods of time. Maintaining adequate internal conditions in the buildings requires high air conditioning loads and electricity consumption.

Transforming the traditional building roofs to “cool roofs”, using the so called “cool colours” can significantly reduce heat absorption and respective energy consumptions for cooling these buildings. In particular, traditional dark-coloured roofing materials strongly absorb sunlight, making them warm in the sun and heating the building. White or special “cool colour” roofs absorb less sunlight, staying cooler in the sun and transmitting less heat into the building. This reduces the need for cooling energy if the building is air conditioned, or lowers the inside air temperature if the building is not cooled.

According to the National Energy Efficiency Program Reducing Electricity Consumption 2010-2020 study, by the Ministry of National Infrastructures, there are three main courses of action that should be undertaken in order to manifest the efficiency programs in the local authorities’ sector: Support incentives for the upgrade of lighting systems, air-conditioning systems, and thermal treatment of roofs.

Electricity consumption by acclimatization systems (cooling and heating) comprises about 40% of local authorities’ energy consumption, and about 50-60% of the energy consumed in buildings. The energy consumed by acclimatization systems may be reduced by at least 30% by performing thermal treatment on buildings’ envelopes. 10% of the overall energy consumed by acclimatization systems can be saved by mere treatment of buildings’ roofs, which is relatively cheap.

The cost of roof retro-fit is relatively lower than treating the rest of the structure’s envelope, and it reduces electricity demands on top floors only. Due to the fact that many local authority institutions are located in relatively low buildings (2-3 storey high) – schools and kindergartens in particular - retro-fit operations are expected to reduce acclimatization consumption by some 5% (compared to a very minor influence on demands in other branches in which buildings are mostly high).

Therefore, in line to the governmental planning, municipal buildings not only constitute one of the ideal test buildings for applying this solution in terms of demonstration purposes to the citizens, but will also be able to achieve some budget cuts and save money for the municipality. A detailed selection of the buildings to adopt this solution should be realized. It is suggested that this solution is implemented in the following buildings’ roofs:

- the Culture hall,
- the Culture center,

| | | | | |
|--|---------|--|---------|---------------------------|
| <ul style="list-style-type: none"> - 3 Activity centres, - the Youth center, - the Welfare department, - the Educational Department, - the new municipal offices, - Other public buildings, - 10 selected schools that phase the most significant problem, out of the 80 in the territory. <p>In this action it is considered that cool roofs will contribute with a 12% reduction of the cooling loads (approximately 6% of the overall electricity consumption), since the majority of the suggested buildings are one or two storeys high. The action will be applied on 6,000m² of municipal roofs approximately. The overall electricity cost for the suggested buildings is approximately 1,500,000 NIS and the suggested solution is expected to create an annual saving of 90,000 NIS. The estimated cost of the investment, covering the materials (use of cool colours or cool roofing material) and the labour is estimated at a range of 19 NIS – 76 NIS per square meter, depending on the solution to be used. A mix of these solutions (some buildings with cool colours, others with cool roofing material) for testing their results is considered, at an average price of 50 NIS per square meter, thus resulting to an overall cost of 300,000 NIS.</p> | | | | |
| General Objectives of the Project | | Principal partners and stakeholders | | |
| <ol style="list-style-type: none"> 1. Demonstrate the feasibility of the cool roofs solution. 2. Reduce the municipality's electricity bills. 3. Reduction of the carbon footprint from the municipal sector. | | <ol style="list-style-type: none"> 1. Engineering department and SEAP team of Ramla Municipality 2. 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. Ramla municipal authority | | <ol style="list-style-type: none"> 1. This action has been proposed as part of the municipality's SEAP in the municipal sector. 2. The action is fully coordinated with the National Energy Efficiency Program | | |
| Estimated investment cost needed | | | | |
| EUR: | 71,500 | | | |
| NIS: | 300,000 | | | |
| 2. Technical Description | | | | |
| Area(s) of intervention (sectors as specified in the SEAP proposed by CoM) | | Main adopted Technology & Equipment | | |
| Municipal buildings | | Cool colours and cool roofing material, for which technological know-how is available in Israel, although not so widespread. The technology is internationally widely acknowledged and proven. | | |
| Site / Place | | Status of the action | | |
| The action focuses on selected municipal buildings | | New | Planned | Under implementation |
| | | | | Following previous action |

| Start date | Project Lifetime | Previous or linked studies | |
|--|--|---|---|
| Mid 2016 | 2 years | No previous studies have been realised on the action. However, since the technology is relatively easy to apply, no in depth studies are needed as well. | |
| Engineering Studies | Not applicable for the specific action | | |
| Implementation plan / Construction plan | The technology is relatively easy to apply. Upon financing of the actions it can be applied in a couple of months. The implementation plan is to have it implemented by the end of 2016. | | |
| Other previous studies | Not applicable for the specific action | | |
| Environmental impact assessment | Not available, although the expected impact can only be considered positive for this 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. | |
| Staff allocated to prepare, implement and monitor the action | | Municipal / City Staff Training Needs | |
| The engagement of 1 part time person from the municipality's personnel for the selection of the buildings to adopt the solution, tender the work and oversee the tenderer's progress in a period of 6 months is envisaged. | | No training needs are envisaged for this action | |
| Technical Assistance Needs | | Role of Partners | |
| No technical assistance is required, since the action is going to be tendered. However, during the tendering procedure, minor assistance from a technical expert for the selection of the most suitable solution in each case should be pursued. | | <ul style="list-style-type: none"> The engineering department and SEAP team will have a role in the selection of the buildings and the monitoring of the action, perhaps through meetings every second week. The Ministry of National Infrastructures, Energy and Water can provide a list with credible companies with experience on the action and any available studies on this technology's potential implementation in other public buildings. | |
| 4. Cost Estimates | | | |
| Initial and start-up expenses | EUR: 71,500 | Net Present Value (NPV) | Return of Investment (IRR) |
| | NIS: 300,000 | | |
| Operational Costs (approx.) | EUR: 0,0 | EUR: 46,500 | The NPV has been calculated for an average life span of ten |
| | NIS: 0,0 | | |

| | | | |
|--|-------------|--|--|
| Annual Income (approx.) | EUR: 21,400 | NIS: 195,000 | years, with an $i = 5\%$. The expected pay back period is a little less than 7 years. |
| | NIS: 90,000 | | |
| 5. Funding Sources | | | |
| Funding Source | | Fund | |
| Local Authority's own resources | | Contribution up to 10% of the project's initial cost | |
| National Funds and Programs | | Ministry of National Infrastructure, Energy and Water resources up to 100,000 NIS | |
| International Institutions | Financial | | |
| 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 | | 90,000 NIS at an annual basis that can be used for a loan or a contract with an ESCO | |
| Other | | | |
| 6. Projected Energy Estimates in 2020 | | | |
| Energy Savings (MWh/a) | | Renewable Energy Production (MWh/a) | |
| 502 | | N/A | |
| CO₂ Reduction (tn CO₂/a) | | | |
| Target Year | | 2020 | |
| Net reduction on the Territory | | 301 | |
| Reduction as related to BAU Scenario | | 0.13% | |
| Per Capita calculated reduction | | 4.4 kg CO ₂ | |
| 7. Summary of Related Awareness Raising (AR) Actions | | | |
| Awareness Raising related to the Action | | | |
| <p>Although the action is not an awareness related one, certain awareness raising activities on the achieved results, depending on the adopted technology each time (cool paint or cool material) will be disseminated to other municipalities as well, since according to our knowledge it will be one of the first implementations of this technology in such scale in public/ municipal buildings. Presentations to other municipalities, circulation of a newsletter and contacts with the national authorities will be conducted.</p> | | | |

| Awareness raising related to the Community |
|--|
| The results of the action will be also communicated to the residents and the constructing companies active in the area. It is important to remember that one of the project's main objectives is to act as demo for the wider municipality, in order to be adopted and replicated in the citizens' houses. |
| 8. Assumptions and risks |
| The technology is proven and no risks related to its use are identified. However, since it is a relatively new technology in Israel, there is a certain risk that the contractor to undertake it applies it properly. The respective assumptions concern the suggested buildings, but more in depth selection of the buildings should be realized. |
| 9. Key Success Factors |
| Selection of the most suitable buildings for the action (low storey buildings with high consumptions). Selection of the contractor with the necessary know how. |
| 10. Next Steps |
| Selection of the most energy consuming buildings, with high cooling needs. |
| 11. Annexes / References to Annexes |
| - |

CES-MED



Campaign for old ACs, lamps and fridges substitution - # No 3

1. General Presentation

| Location | Start date | Project Lifetime |
|--|------------|------------------|
| Ramla municipality | 2016 | 5 years |
| Project Owner / Lead Actor | | |
| Municipality of Ramla | | |
| Contact person | | |
| Ms. Sharon Etrner head of Environment department | | |



Summary of the Action

The households' sector in Ramla contributes with almost 22% in the total energy consumption and 26% in the carbon footprint of the territory. It is one of the most significant CO₂ emitters in the area and the local authority is giving priority to it.

Air-conditioning (A/C), lighting and domestic white appliances comprise the greatest energy consumers in the residential sector.

According to the National Energy Efficiency Program – Reducing electricity consumption 2010-2020, by the Ministry of National Infrastructures, the expected annual energy savings per household due to the use of energy efficient refrigerators following the regulation change, as of 2012, is estimated at 1,278 kWh, while due to the use of energy efficient A/Cs 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 Ramla 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 fridge with the simultaneous retraction of the old appliance will be subsidized for at least 2,000 households, at a percentage of 30%. The households to be benefitted from the same measure regarding ACs will be 3,500, while an additional 5,500 households taking advantage of the offered subsidies regarding the light bulbs. In this way, by 2020, at least 1 out of 2 houses will have benefitted from one of these subsidies. If strict financial criteria are to be considered for the beneficiaries, in order to have the most in need taking advantage of the action, 2,000 households will benefit from all three measures, while another 1,500 will benefit from the substitution of ACs and lamps.

The expected energy savings from these activities are presented in the following table.

| Appliance | Number households | of Average savings per household | Total Savings |
|---------------|-------------------|----------------------------------|---------------|
| Refrigerators | 2,000 | 1,278 kWh | 2,556 MWh |
| ACs | 3,500 | 1,344 kWh | 4,704 MWh |
| Lamps | 5,500 | 0.655 kWh | 3,602 MWh |

Thus, the overall energy savings are estimated at 10,862.5 MWh.

The average prices for an appliance of at least A energy class, are:

- 2,400 NIS for a refrigerator;
- 1,900 NIS for an AC inverter;
- 105 NIS for the household's lamps.

The total cost for the purchase of the above mentioned equipment is 12,000,000 NIS, where 30% of the amount, namely 3,600,000 NIS will be subsidized by the government, while the rest 8,400,000 NIS will be covered by the household owners.

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.

| General Objectives of the Project | | Principal partners and stakeholders | | | |
|---|---|--|--|----------------------|---------------------------|
| <ol style="list-style-type: none"> 1. Reduce the households' electricity bills. 2. Reduction of the carbon footprint from the household sector. | | <ol style="list-style-type: none"> 1. Environment department and SEAP team of Ramla Municipality 2. 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. Ramla citizens | | <ol style="list-style-type: none"> 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 National Energy Efficiency Program and previous initiatives for the provision of incentives to the citizens. | | | |
| Estimated investment cost needed | | | | | |
| EUR: | 857,000 | | | | |
| NIS: | 3,600,000 | | | | |
| 2. Technical Description | | | | | |
| Area(s) of intervention (sectors as specified in the SEAP proposed by CoM) | | | Main adopted Technology & Equipment | | |
| Residential buildings | | | Household appliances of high energy class is internationally widely acknowledged and proven. | | |
| Site / Place | | Status of the action | | | |
| The action focuses on approximately half the households in the municipality, namely 11,000. | | New | Planned | Under implementation | Following previous action |
| Start date | Project Lifetime | Previous or linked studies | | | |
| Mid 2016 | 12 years | Study by the MIEW, National Energy Efficiency Program. Specific study for Ramla is not available, but also not needed | | | |
| Engineering Studies | Not required | | | | |
| Implementation plan / Construction plan | The technology is relatively easy to apply. The implementation plan is to have it gradually implemented by the end of 2020. | | | | |
| Other previous studies | Not available | | | | |

| | | | |
|--|---|---|--|
| Environmental impact assessment | Not available, although the expected impact can only be considered positive for this 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. | |
| Staff allocated to prepare, implement and monitor the action | | Municipal / City Staff Training Needs | |
| The part time engagement of 1 person from the municipality's personnel for coordination purposes. The action is going to be conducted in collaboration with the MIEW | | No training needs are envisaged for this action | |
| Technical Assistance Needs | | Role of Partners | |
| No technical assistance is envisaged for this type of action. | | <ul style="list-style-type: none"> The environment department and SEAP team will have a role in the selection of the suggested equipment and the monitoring of the action, perhaps through meetings every second week. The Ministry of National Infrastructures, Energy and Water can provide financing for the action. | |
| 4. Cost Estimates | | | |
| Initial and start-up expenses | EUR: 857,000 | Net Present Value (NPV) | Return of Investment (IRR) |
| | NIS: 3,600,000 | | |
| Operational Costs (approx.) | EUR: 0,0 | EUR: - | The action doesn't create monetary savings for the municipal authority. The NPV for the households benefitting from the action is positive. The action contributes to the national energy saving goals and preservation of natural resources |
| | NIS: 0,0 | | |
| Annual Income (approx.) | EUR: - | NIS: - | |
| | NIS: - | | |
| 5. Funding Sources | | | |
| Funding Source | | Fund | |
| Local Authority's own resources | | Coordination of the activity by providing the necessary personnel | |
| National Funds and Programs | | Ministry of National Infrastructure, Energy and Water resources | |
| 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 | No cost savings are envisaged |
| Other | |
| 6. Projected Energy Estimates in 2020 | |
| Energy Savings (MWh/a) | Renewable Energy Production (MWh/a) |
| 10,862.5 | N/A |
| CO₂ Reduction (tn CO₂/a) | |
| Target Year | 2020 |
| Net reduction on the Territory | 6,517.5 |
| Reduction as related to BAU Scenario | 2.8% |
| Per Capita calculated reduction | 163 kg CO ₂ |
| 7. Summary of Related Awareness Raising (AR) Actions | |
| Awareness Raising related to the Action | |
| Extensive awareness raising activities should be carried out in order to publicize the action among the citizens. Announcements to the municipal social media and web page, as well as advertisements on billboards, radio, and newspapers will be realised. These awareness raising activities will be conducted in close collaboration with the Ministry of National Infrastructures. | |
| Awareness raising related to the Community | |
| Due to the nature of the action, the awareness raising activities carried out for it are directly addressing the community. Summary of the achieved results in terms of appliances substituted, grants provided and energy savings achieved will be also publicized at an annual basis, and upon the program's completion. | |
| 8. Assumptions and risks | |
| The technology is proven and no risks related to its use are identified. The respective assumptions and calculations have been based on national averages. This action should be accompanied with capacity building actions envisaged for the citizens, in order to maximize the potential savings. | |
| 9. Key Success Factors | |
| Frequent maintenance of the ACs in order to maintain their performance. Monitoring of the achieved savings and identification of any variations from the envisaged consumptions. | |
| 10. Next Steps | |
| Collaboration with the MIEW in order to identify the most efficient way to launch the program | |
| 11. Annexes / References to Annexes | |
| - | |

The 10% voluntary commitment campaign - #4

1. General Presentation

| Location | Start date | Project Lifetime |
|---|------------|------------------|
| Ramla municipality area | 2016 | 5 years |
| Project Owner / Lead Actor | | |
| Municipality of Ramla | | |
| Contact person | | |
| Ms. Sharon Etner – head of Environment Wing | | |



Summary of the Action

The 10% voluntary commitment campaign will be launched by the municipality across a series of sectors in the territory, including the tertiary as well as the residential sector and schools. The specific fiche focuses on the tertiary sector campaign, although the campaigns with the rest of the sectors will be interlinked and in close coordination. Many of the owners of small and medium businesses live in Ramla, so it is assumed that some of the insights will also be brought home, thus giving it a wider exposure and impact throughout the municipality.

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 will be the introduction of the "Energy friendly business label", which will be adopted as a marketing campaign by the municipality. Thus, 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 project will be led by the SEAP municipal team, coordinated by the head of the environment department, which is also the department responsible for registration and licensing of all businesses in town. The first main task will be to recruit the participants from the SMEs. Once they have volunteered for the program, the participants will be grouped by similarity on several criteria, such as number of employees, how much energy is being consumed, type of sector etc. The groups will have a short course on how to reduce their energy consumption, with additional meetings towards the end of the year.

9 months after the beginning of the group, another short round will take place (2 meetings) – which will help to maintain the reduction, give room for questions, ideas from participants, local success stories, etc.

12 months after the beginning – the first award ceremony will take place, led by the mayor.

| | | | | |
|---|-------------------------|--|---------|---|
| <p>Participants will receive an award, and will have a visual aid (sticker / plaque / medal) to present in their business place. The best results (bigger savings) will receive an additional prize.</p> <p>The success of the first teams must be maintained and additional businesses should be recruited. The action is planned as an on-going process of at least 5 years. Therefore, it is foreseen that the Mayor and municipal staff will present the project in their meetings and in as many other activities throughout the city, as it will be considered a project under the "mayors' wings".</p> | | | | |
| General Objectives of the Project | | Principal partners and stakeholders | | |
| <ol style="list-style-type: none"> 1. Educate as many business owners on the importance of Energy Efficiency 2. Lead as many business owners towards reducing 10% of their energy consumption 3. Reduction of the carbon footprint from SME | | <ol style="list-style-type: none"> 1. Environment department (including business licensing dpt.) and SEAP team of Ramla Municipality 2. Ministry of National Infrastructure, Energy and Water 3. Ministry of Economics | | |
| Ultimate beneficiaries of the project | | Link to municipal development plans / urban plans / other municipal or city programs | | |
| <ol style="list-style-type: none"> 1. Business owners (SME) based in Ramla 2. Ramla citizens (as most of the owners live in Ramla) | | <ol style="list-style-type: none"> 1. This action has been proposed as part of the municipality's SEAP in the tertiary sector. 2. The action is fully supported by the Mayor who considers the tertiary sector to be very important for the well-being of the town: creating jobs, reducing carbon footprint and setting an example for all customers. | | |
| Estimated investment cost needed | | | | |
| EUR: | 130,950 | | | |
| NIS: | 550,000 | | | |
| 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 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 Small and Medium businesses (SME) throughout the city. | | 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 department of the municipality will find relevant lecturers, and develop the program of the short course and meetings with the assistance of professionals such as the Manufacturers Association of Israel or similar body, and with Energy Efficiency experts. | | |

| | |
|--|--|
| Engineering Studies | Not applicable for the specific action |
| Implementation plan / | Not applicable for the specific action |
| Other previous | The BEI is the only study that gives gross data on the tertiary sector's consumption |
| Environmental impact | 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 character (awareness and capacity building), no other body will be engaged. |
| Staff allocated to prepare, implement and monitor the action | Municipal / City Staff Training Needs |
| <p>The Environment department with the business licensing dpt. will be engaged in this activity for its implementation and overall coordination.</p> <p>The municipal staff will be responsible for the "call for participants", preparing the online forms, assisting in creating the groups, organizing the participants lists, finding lecturers, preparing informational material, organizing at least 2-3 events each year. Although existing material from the Ministry of National Infrastructures, Energy and Water resources may be utilized, it will have to be adjusted.</p> <p>Marketing and promoting the program while finding more business owners to commit and join the groups will take place throughout the 5 year period.</p> <p>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 for the first two years.</p> | <p>Some training needs for the municipal staff is considered necessary for the action's preparation, implementation and monitoring.</p> <p>Marketing the project, approaching the diverse target audience is not simple and should be planned accordingly. Materials should be prepared for the groups, based on existing programs, however they need to be adapted for SME type groups, with adaptations relevant to different sizes, types of businesses etc. There is also need for visual aids to be developed, in accordance with other action plans (same logo or similar, same names used, or similar).</p> <p>This type of activity does not need official training, but does need the consultant as a mentor. The first two years will create the basis for the following years, with additional challenges foreseen, especially in recruiting new participants for the program on the one hand, and keeping the first participants in the loop, maintaining their savings success, or making adjustments where savings are not being realized.</p> <p>As the present municipal staff is very much overworked and cannot add 100% to their workload, additional staff is necessary.</p> |

| Technical Assistance Needs | Role of Partners |
|---|---|
| No technical assistance is required, due to the nature of the action. | <ul style="list-style-type: none"> The SEAP team will be in close collaboration with the Environment department, providing all technical expertise considered necessary, and with the business licensing department for the outreaching, monitoring and implementation of the awareness raising and capacity building. 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 Ministry of Economics is responsible for the SME and as such has some programs relevant to the matter. Therefore the ministry is expected to provide additional educational material, assist with promotion, and also is expected to participate with a certain amount to cover the operational costs. |

4. Cost Estimates

| Initial and start-up expenses | EUR: 26,190 NIS: 110,000 | Net Present Value (NPV) | Return of Investment (IRR) |
|-------------------------------|--|-------------------------|--|
| Operational Costs (approx.) | EUR: 26,190 (awareness raising) NIS: 110,000 (awareness raising) | 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. |
| Annual Income (approx.) | EUR: N/A NIS: The action doesn't generate income, but energy savings for the citizens | 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 Economics 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) |
| 26,193 | N/A |
| CO₂ Reduction (tn CO₂/a) | |
| Target Year | 2020 |
| Net reduction on the Territory | 15,715.8 tn |
| Reduction as related to BAU Scenario | 6.78% |
| Per Capita calculated reduction | 0.393 tn CO ₂ |
| 7. Summary of Related Awareness Raising (AR) Actions | |
| Awareness Raising related to the Action | |
| <p>Awareness raising activities will be realised broadly to disseminate the upcoming 10% voluntary savings program for SMEs. Info dissemination will be realised through the production of brochures and posters to be sent by post to all businesses and be visible in all municipal buildings respectively. Radio short messages in the initiative may also be utilised as well as direct outreaching in the business area (mostly centre of town and the industrial areas).</p> <p>Participation in the program will also be offered to all those who come to the municipal building for services, such as renewal of business licensing tax payment and similar opportunities of meeting the municipal staff.</p> <p>The activities as well as the printed information will be both in Hebrew and in Arabic since the population is mixed.</p> <p>After the groups will be held, the end of the year ceremony will be led by the Mayor and will have broad PR activity. In addition, the project will be presented in professional meetings and conferences, with the results that will be accumulated yearly.</p> | |
| Awareness raising related to the Community | |
| <p>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. All businesses that will participate will receive a visual aid (sticker) they will present in their place of work, the citizens will recognize the logo, and see more and more places joining the voluntary campaign.</p> | |
| 8. Assumptions and risks | |
| <p>The main assumption and at the same time risk for the action is the interest of local small and medium business owners to participate in the voluntary campaign and adopt in real life the new knowledge they have acquired. In addition, in order to be evaluated for the 10% reduction, they must present their business electricity bill of their business. This might be an obstacle for some business owners who value their privacy. It is also necessary to keep the campaign going so as to engage more and more</p> | |

participants, this is not always simple especially as the municipality's resources are very low, and cannot finance this action without external financial assistance.

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 Ramla. Therefore, we expect a synergistic effect from the different campaigns that will take place in the city.

10. Next Steps

- Organization of the municipal team
- Preparation of the educational material
- Initiation of the awareness raising activities related to the action and organization of the first groups.

11. Annexes / References to Annexes

-



Cycling promotion and creation of related infrastructure - #5

1. General Presentation

| Location | Start date | Project Lifetime |
|---|------------|------------------|
| Ramla municipality area | 2016 | 15 years |
| Project Owner / Lead Actor | | |
| Municipality of Ramla | | |
| Contact person | | |
| Ms. Sharon Etner – head of Environment 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 Ramla an increased number of riders are using the roads and paths to get to schools, workplaces, leisure activities and more. However, the density of the city especially in the centre combined with the lack of infrastructure makes riding bicycles difficult and even dangerous for the pedestrians as well as for the riders themselves. Some of the riders are motivated by the sustainable aspect, while others from the economic. As a relatively large percentage of the population have lower financial means, bicycles have become a solution also for them. The use of 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 for the dire need for bicycle lanes, it is also necessary to add the complementary infrastructure i.e. parking devices as well as protected cages or similar solutions for them not to be stolen. Unfortunately bicycle theft is quite common and presents as one of the main reasons people abandon this mean of transportation.

Since there are virtually no bicycle lanes in Ramla regular bikes, some electric bikes, scooters and other non-motor vehicles use the car lanes, or the pavement - a fact which presents a nuisance and even a danger for the riders, cars, pedestrians, baby prams and young children.

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), around 10km, across the road network of Ramla. This network will be connected with the cycling route leading to neighbouring cities, planned at the governmental level to be realised in the coming years.

As the city of Ramla is expanding quite a bit, a preliminary transportation master plan has been commissioned. The plan recommends the construction of bicycle 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.
- 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.

Average cost for construction of the bicycle lanes per km is around 1,000,000NIS (238,000€), thus the implementation is planned to be gradual, depending mostly on external funding.

- 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 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 train 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.

| General Objectives of the Project | | Principal partners and stakeholders | | | |
|--|------------|---|--|----------------------|---------------------------|
| <ol style="list-style-type: none"> Educate citizens from all ages on the advantages of cycling, using scooters and riding/driving safety regulation concerning the designated lanes Promote using bicycles Reduction of the carbon footprint from transport | | <ol style="list-style-type: none"> Engineering department and SEAP team of Ramla Municipality NGO for promotion of cycling (Israel on the route of cycling and similar) Ministry of National Infrastructure, Energy and Water Ministry of Transportation | | | |
| Ultimate beneficiaries of the project | | Link to municipal development plans / urban plans / other municipal or city programs | | | |
| <ol style="list-style-type: none"> Ramla citizens of all ages from youngsters up to the elderly | | <ol style="list-style-type: none"> This action has been proposed as part of the municipality's SEAP in the transportation sector. The action is fully coordinated with the municipal transportation Master Plan that has been commissioned by the Mayor | | | |
| Estimated investment cost needed | | | | | |
| EUR: | 2,600,000 | | | | |
| NIS: | 10,750,000 | | | | |
| 2. Technical Description | | | | | |
| Area(s) of intervention (sectors as specified in the SEAP proposed by | | | 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 | Previous or linked studies | | | |
| Mid 2016 | 15 years | <p>A general road Master Plan has been realised, however specific plans need to be commissioned and presented to the planning committee (regional) to be examined and approved by it.</p> <p>The ministry or Transportation also needs to approve any changes (routes, road signs)</p> <p>Some educational material that needs to be adjusted to the needs (for different ages, bicycles and other non-motor vehicles).</p> | | | |

| | |
|--|---|
| Engineering Studies | Transportation Master Plan has been realized. More detailed studies are 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 | 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 | 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 |
| <p>The Engineering wing with the environment department will be engaged in this activity for its implementation and overall coordination.</p> <p>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.</p> <p>After approval, they will be responsible for tendering the work itself (construction) and overseeing it.</p> <p>The environment department will be responsible for the educational part and awareness raising. This will be done in cooperation with schools (and the education wing), senior citizens (in coordination with the social workers), employment centers in Ramla and the general public.</p> <p>The engagement of at least 2</p> | <p>Training needs for the municipal staff are not considered necessary for the action's preparation and monitoring.</p> <p>The staff chosen for the project are knowledgeable and can take on the tasks, taking into consideration that they will have additional staff.</p> <p>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.</p> <p>Therefore, it is considered possible to implement with the staff, if they engage additional personnel, as mentioned above.</p> <p>If, however this will not be the case, the use of external consultants will be necessary to cover for the necessary human resources needed.</p> |

| | |
|--|--|
| people from the municipality's personnel for the above mentioned actions is envisaged (half engineering wing, half environment wing – including the awareness raising activity). | |
| 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. | <ul style="list-style-type: none"> 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: 254,000 NIS: 10,670,000 | Net Present Value (NPV) | Return of Investment (IRR) |
|-------------------------------|---|-------------------------|---|
| Operational Costs (approx.) | EUR: 4,700 (awareness raising) NIS: 20,000 (awareness raising) | 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. |
| Annual Income (approx.) | EUR: NIS: | 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 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) |
| 2,008 MWh in 2020 6,900 MWh in 2030 | N/A |
| CO₂ Reduction (tn CO₂/a) | |
| Target Year | 2030 |
| Net reduction on the Territory | 1,717 |
| Reduction as related to BAU Scenario | - |
| Per Capita calculated reduction | 2.5% |
| 7. Summary of Related Awareness Raising (AR) Actions | |
| Awareness Raising related to the Action | |
| <p>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). The activities as well as the printed information will be both in Hebrew and in Arabic since the population is mixed.</p> | |
| Awareness raising related to the Community | |
| <p>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.</p> | |
| 8. Assumptions and risks | |
| <p>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.</p> <p>In addition, safety is of the utmost importance, and accidents involving bicycles and scooters present a risk in this case.</p> | |

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 considered 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.

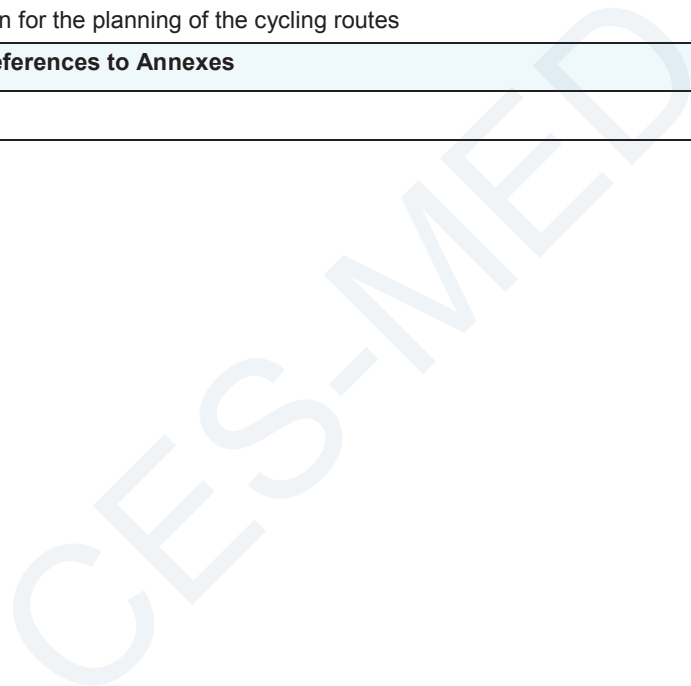
10. Next Steps

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

Urban mobility plan for the planning of the cycling routes

11. Annexes / References to Annexes

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ANNEX E – Citizens Awareness Promotion Plan (CAPP)

CES-MED



Ramla

It's our responsibility to become greener

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)*
[\(\[http://www.ces-med.eu/images/CAPP/Annex_7_CAPP_v.4.0_02122014_EN.pdf\]\(http://www.ces-med.eu/images/CAPP/Annex_7_CAPP_v.4.0_02122014_EN.pdf\)\)](http://www.ces-med.eu/images/CAPP/Annex_7_CAPP_v.4.0_02122014_EN.pdf)
- *Part 2 includes:*
 - o *PPT Presentation of the CAPP Guidelines*
 - o *Presentation of “how to prepare and implement a communication and an awareness campaign” showing techniques, materials and models*
 - o *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:*
 - o *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.*
 - o *Table2: presents the content of a plan to implement a CAPP action related to a Pilot Project.*
 - o *Table 3 presents the proposed actions related to the general sustainable energy challenges and to the city.*
 - o *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 in 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 Ramla

Aim

The questions in the attached templates cover various areas of actions and levels of awareness linked to behavioral 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 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 of the city's inhabitants. They were free to seek the opinion of a limited number of persons to help fill the answers.
- (ii) The filled 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 | X | X | |
| Seniors | | X | X |
| Other (school kids) | X | | |

| 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 | |
| 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 | | |
| 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, a number of activities, especially in the source separation of waste. Some other activities have also been made in energy efficiency – street lights were changed and automation has been put in sports facilities. These were accompanied with signs on the poles explaining the reason for the automation – how to use them, and that the electricity saving project is led by the mayor. |
| If yes, who conducted the actions (the city/municipality, NGO, national authority...) | The local municipality conducted the activity with the assistance from the ministry of environment and the ministry of energy. |
| If yes, describe the action | Different festivals have been organized on recycling and waste separation, shows, plays, etc. Some initial work has been done with the home owners' association, to raise awareness on electricity savings in homes. A poster has been developed, and will be distributed to the buildings, after an awareness raising meeting (lectures) with the home committees (each apartment building has a committee). |
| If yes, what was the budget and how did you fund it | N/A |
| If yes, outcome, impact and feedback | N/A |

| V. Public consultation | |
|--|--|
| Does the city practice public consultation? | Yes, mostly through a group of volunteers. The CES-MED project and the 20% commitment has been publicized in the municipal website. In addition, some of the other meetings that were held in Ramla (when the CES-MED project and the ministry of Energy representatives came to the city); this event was also reported on the website. |
| Has the city done public consultations for SEAP? | No; However, the BEI and the general main points of the SEAP have been presented to the mayor and the department heads of the municipality. The project has been approved by the council members. |
| Is it part of the legislative process? | It is part of the legislative process to have the program and the commitment approved by the councilmembers, who are all elected representatives of the public. In addition, all implementation plans must be approved by the same forum, when discussing the annual budget, and if there are additional implementations during the fiscal year. |
| Foreseen consultation(s) | N/A |
| Does the city liaise with national institutions, stakeholders? | The municipality is working with several government ministries, in this case it is the ministries of energy and environment. |

Situation analysis

From this study, it appears that the target groups that are aware and informed about energy challenges are mostly the young generation as well as school kids; They have been identified as the ones giving high importance to sustainable energy, are well aware about issues related to this sector and open to any information. It is therefore essential to involve them in awareness actions so that they become future ambassadors of sustainable energy in the territory.

Women groups and seniors seem to have an ambiguous attitude in the importance they give to sustainable energy, and are not aware or informed of issues related to this subject; they would, therefore, need more persuasion to change their perceptions and behaviour.

The templates show that the important leverages on which we can use and base our communication upon are the price and (non) availability of energy, however the population seems oblivious to its availability, the cleanliness of the environment and the management of waste.

The ambiguity lays in the fact that the citizens of Ramla are in general aware about some energy issues and challenges but do not feel convinced about the existing ways to solve them such as renewable energies, or do not feel convinced about the level of importance of these issues and existing means to reduce the impact of climate change for instance; nevertheless, they are very much alarmed by the cost of energy and its waste.

The municipality of Ramla has undertaken awareness raising actions and campaigns related to waste management and efficient energy but has no feedback about their impact on changing behaviours. For this reason, the municipality has collaborated with a home owner's association via direct actions with the population. The means of communication, and the tools used were brochures and explicatory signs; however, there is no data on the media coverage and penetration it has achieved.

Finally, regarding public consultations, as part of the legislation of the city, they represent the importance of the responsibility of the local authority towards its community. In that respect, they have been well carried out by the volunteers and through project and ministry representatives visiting the city, and the project have been appraised on the city website. Nonetheless, the SEAP has not gone through this process but has been approved by the heads of the municipality. The city is initiating communication and cooperation with the respective ministries of energy and environment.

Template 2.1

Proposed Communication or Awareness Raising Action related to Specific/Pilot Project: The commitment campaign

1. Title of the Pilot Project:

The 10% voluntary campaign in (SME) small and medium businesses

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

We too have committed to take care of the environment and reduce 10% of our electricity consumption.

3. Location:

Businesses throughout the city, community centres (where the capacity building will occur), municipal building (business registration office), a big important hall (for the annual ceremony)

4. Summary of the Communication Action

General objective:

To save at least 10% of the electricity consumption in small and medium businesses in Ramla while empowering business owners from a variety of fields of expertise, education level, and business size (we expect a saving of 6% of the overall sector's consumptions which is the result of approximately 3-4% of the businesses achieving the 10% reduction, and another 5-6% achieving lower reductions, around 3% of their consumptions).

Key Message:

it's worthy to save energy, save money and contribute to the environment –
it's in your hands.

Theme: Buildings energy consumption

Target group:

Small and medium business owners across town. Many of the owners live in Ramla, so it is assumed that some of the insights will also be brought home. Therefore, the residential area will also profit from this. Since other actions are aimed for the residential sector, the two processes will complement each other.

5. Organization:

Roles and responsibilities:

The project will be led by the SEAP municipal team led by the head of the environment department, which is also the department responsible for registration and licensing of all businesses in town.

The first main task is to recruit the representatives from the SMEs. Once they have chosen to participate in the program, a short energy audit should take place in each of the businesses. It is also important to have several classifications, so as to group them with similar sized businesses. The similarity should be on several criteria, such as number of employees, how much energy is being consumed, type of sector etc.

The next stage would be to make up the groups, according to the different criteria and have a short course on how to reduce their energy consumption.

Feedback on the energy audit – can be done individually or as part of the course (using the data as real-life examples).

Follow up – in order to keep up the reduction process it is not enough to have a short course. It is important to escort the participants and help them implement the changes, keep them going and maintained.

9 months after the beginning of the group, another short round will take place (2 meetings) – which will also help maintain the change, the competition between the successes of different participants, possibly difficulties raised by them etc.

12 months after the beginning – an award ceremony held by the mayor. It would probably be necessary to give different types of awards (the ones who saved the most in %; the ones who saved 10%, the ones that are on the way). All participants will get an award, and will have a visual aid (sticker / plaque / medal) to present to the clients.

After the first year – the success of the first teams must be maintained; more businesses should be recruited. This is an ongoing process of at least 5 years.

Project lifetime: 2016-2020

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 businesses activity will be published in municipal forums, especially in ones that concern or involve the private sector.

The project will be presented in meetings the municipal staff are present in – from the mayor and down. This project will be under the mayor's "wing" – and will be mentioned where ever relevant.

On thematic days and other occasions led by the municipality, a banner or a desk will be present – to recruit more participants and to show who is already participating.

As mentioned earlier, there will also be a competition held between the participants, and the winners will receive a prize or a different honorary plaque from the mayor, in the annual ceremony.

Principal partners and stakeholders and their roles:

The mayor, the municipal SEAP team, ministry of energy, ministry of economics, the small and medium business agency, manufacturers association in Israel.

Staff training needs:

Since this project aims at reaching small and medium businesses in the town, it's quite a big operation. They are not well organized and represent a very diverse group that usually doesn't get approached by the municipality, unless it's relating to taxes and other law related issues.

We believe it would be advisable to have the energy expert who has been working with the municipal teams for the past 18 months, assisting in building the teams' capacity and develop the SEAP with them. The complexity of the project is such that the municipal team can head the project, but do not have enough manpower to manage the project in addition to their current jobs.

The energy expert will make the small energy audits, give the results and recommendations and hold the meetings of the business owners (or managers) leading them on how to reduce their energy use at their business (weekly, bi-weekly, every few months – as the program progresses).

The energy expert will be both the information expert, and the coordinator of the project.

Technical assistance and expert needs:

[most of the expert needs are included in the above section]. 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 homes, and the marketing needed for the project. This will be done in coordination with the spokesperson of the municipality.

6. Cost estimate

- Estimated implementation cost: 131,000 EUR (550,000 NIS)
- Funding source (available and foreseen): municipal funding; government – ministry of energy, ministry of economics (SME agency); Israeli manufacturers association
- Initial and start-up expenses and approximate operational Costs:
 - a. energy expert for half a day a week (group courses, follow up meetings, and coordination of project)
 - b. Man days of graphic and PR professional (logo, flyers, website, billboards, newspapers, magnets, stickers, plaques)

7. Follow-up, evaluation and impact assessment:

It is important that the SME groups progress and more participants will join – in an ongoing recruit process. Therefore, all businesses that have participated should be listed and compared against the list of all businesses. This can be done all the time, but especially when they need new permits or other certification. If there is a stop or slowing down in recruiting new members, actions should be taken to "re-start"/ "boost the project. It is expected to happen after some time, and should be taken into account in the first planning (for example: another big event for the SME with the mayor).

The competition should be annual and ongoing. The data from the competitions (electricity bills the participants will bring) will give us the numbers needed to see how much is being saved. If the saving stops or starts to slow down – another boost should be given, this time in the SME who have already participated (for example an additional short course or some lectures for the past participants).

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 |
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| <p>Municipal buildings:</p> <p>Green Procurement procedures for municipal buildings</p> | <p>Provide goods and services with a reduced environmental impact throughout their life cycle. Thus minimizing environmental impacts, including less energy consuming equipment.</p> <p>Apply this action in all energy consuming equipment and services purchased by the local authority of Ramla, with emphasis on office equipment, lighting and air-conditioning.</p> <p>Apply this action on all related municipal purchases leading to 10% energy savings from the related municipal consumptions till 2020, through the purchase of new equipment of high efficiency standards or gradual substitution of aged energy consuming equipment with more efficient one.</p> | <p>Topic:</p> <p>Green procurement for a better environment: by promoting ecological product market while showing the Public Administration commitment with sustainability.</p> <p>Activities:</p> <p>Creating new rules for procurement and disseminating them to all employees;</p> <p>Starting green procurement courses for all employees to deal with purchasing;</p> <p>Setting up information lectures for municipality employees focusing on the importance and relevance of green procurement for the different departments, with specific days for those dealing with procurement and electricity information via municipal intra-net; emphasis will be made on matching behaviour between work and home (buying at home similar products that are purchased at work);</p> <p>Laying information stickers on relevant products (what is green in the product, why it was chosen) as well as posters in all municipal buildings and facilities;</p> <p>Launching information days for the buildings' committees – with up-to-date lectures on buildings better management (roofs colours and insolation, importance of window insolation and shading), and saving energy; tips on how each homeowner can save electricity at home (energy label, replacement of old inefficient products, insulation, smaller rooms to be used when heating / cooling is needed, efficient</p> |

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| | | <p>lights...).</p> <p>Initiating capacity building courses to the representatives who have attended the above information days and are interested in widening their knowledge.</p> <p>Developing posters, brochures, stickers, magnets and handing them out to the representatives as a tool to replicate the activity and educate the homeowners in their buildings;</p> <p>Instigating meetings with representatives to assist with implementation in their buildings, inviting volunteers to assist them in a passing on the information;</p> <p>Introducing information days to the general public, after they have received some information from their representatives, to add knowledge and information;</p> <p>All information and tips will be made available on the municipal web site, local newspapers, electronic media etc.</p> |
| <p>Residential: Awareness raising activities for the residential buildings association</p> | <p>Promote energy efficiency principles among the members of the residential buildings' committees (who ensure the building's management in all rising issues, in particular, every multi-family building);</p> <p>Target these committees on the need for better energy management of the building, which will lead to energy and cost reductions.</p> <p>Coach committee members to not only adopt a better management in their facilities, but to also pass the related information to the building tenants, ensuring a multiplying effect (It is expected that approximately 500 committee members will be reached through this activity).</p> | <p>Topic: Raise awareness and capacity building, educate and inform users on the benefits of energy efficiency and saving.</p> <p>Activities: Launching information days for the buildings' committees – with up-to-date lectures on buildings better management (roofs colours and insolation, importance of window insolation and shading), and saving energy; tips on how each homeowner can save electricity at home (energy label, replacement of old inefficient products, insulation, smaller rooms to be used when heating / cooling is needed, efficient lights...).</p> <p>Initiating capacity building courses to the representatives who have attended the above information days and are interested in widening their knowledge.</p> <p>Developing posters, brochures, stickers, magnets, fact sheets and handing them out to the representatives as a tool to replicate the activity and educate the homeowners in their buildings;</p> <p>Instigating meetings with representatives to assist with implementation in their buildings,</p> |

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| | | <p>inviting volunteers to assist them in a passing on the information;</p> <p>Introducing information days to the general public, after they have received some information from their representatives, to add knowledge and information;</p> <p>All information and tips will be made available on the municipal web site, local newspapers, electronic media etc.</p> |
| <p>Promotion of Eco driving</p> | <p>Instigate the adoption of eco-driving principles and significantly decrease cars' consumption among all drivers: private, public, taxis, trucks etc.</p> <p>Engage all private transport sector companies activated in Ramla in order to involve their professionals in the trainings (according to studies, these trainings lead to consumption reduction up to 20% directly after training and about 5% in the long run).</p> | <p>Topic: Foster eco-driving skills among the general population to improve efficiency and reduce CO2.</p> <p>Activities:</p> <p>Realizing, as a first step, a mapping of the private transport professional sectors such as different private taxi companies, bus drivers, "service-taxis" (taxis with routes), truck drivers etc.</p> <p>Launching, as a second step, of specialized eco-driving training seminars to educate drivers to entail the adoption of eco-driving principles, involving different organizations towards this goal; with specialized short courses, for eco driving on the different types of vehicles (busses, mini-busses, regular sized cars – some diesel some petrol). Courses will be subsidized and undertaken on a voluntary basis.</p> <p>Organizing a series of seminars targeted at the private transport professionals in Ramla. 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.</p> <p>These seminars will be subsidized by the municipality, which will be in close collaboration with all private transport sector companies activated in Ramla, in order to ensure that all their professionals will undergo this training, even a repeatable session if considered required, within the 2020 horizon.</p> <p>Creating a logo, a slogan, to promote the eco driving (i.e. "I am a green driver");</p> <p>Promoting the green/eco driving campaign radio, website and other relevant media in Ramla.</p> |

Nota Bene: In general, the citizen's awareness raising activities will include many actions such as information days, posters, radio jingles, newspaper publications, billboards, internet and intra-net information, marketing, advertising etc. The actions will differ in content and end-clients target, but they all need a full campaign to succeed. Therefore, the city must hire a professional in the PR / Media campaign. This expert / company needs to take all parts of the SEAP – and incorporate it into one general campaign with different sections in it. It should have one logo, one clear message, once clear brand. Under this, there can be many smaller, specific campaigns that all connect to the general umbrella one. Otherwise each action will have to "invent" the colour scheme, the message etc. This will be more expensive and far less effective. The expert should build the campaign with the SEAP municipal team, as well as with the municipal spokesperson, so as to create the best "suit" for the city, its needs, its character, its priorities.

CES-MED

Template 3.2

CAPP activities as related to SEAP Priority Actions of Ramla

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: |
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| <p>1- Upgrade of the municipal buildings and facilities' AC systems</p> | <p><u>Target Audience:</u></p> <ul style="list-style-type: none"> - Civil society, private and public stakeholders - Municipality staff - Schools and all other governmental facilities and staff - Professionals in energy sector - Government agencies and associations <p><u>Key Message:</u></p> <ul style="list-style-type: none"> - It makes a difference to the future of the city in its quest for greater energy efficiency. - Air Conditioning is the most significant energy consumer in buildings; don't let it waste 40% of your energy consumption. <p><u>Objectives:</u></p> <ul style="list-style-type: none"> - Increase the staff capacity with new implementations of actions - Achieve a resilient and sustainable municipality by using Renewable Energy and making it a source of energy for the municipality. - Reduce power consumption as well as the municipal energy bill - Promote the project and the strategic vision of the city at local, national and international level in the clean energy sector. - Contribute to 35% energy savings of the specific category's consumptions by 2020. - Instigate commendable behaviour at home as in the municipality. <p><u>Communication Tools:</u></p> <p>Information lectures for municipal employees with specific thematic days for those dealing with procurement and electricity.</p> <p>Posters in all municipal buildings and facilities.</p> <p>Competition between buildings / departments.</p> <p>Dissemination of information via municipal intra-net.</p> <p>Information stickers on the A/C units – how much the new unit is saving compared to the old one replaced.</p> <p>Educational activities in schools where the A/C units have been replaced (explanation on savings, calculation assignments, drawing assignments etc. It is important that the children using the classroom will know why the A/C has been replaced.</p> |

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| | <p>Info days for the citizens to achieve replicability, dissemination of messages through radio, newspapers and television, especially using local media, production of promotional material (leaflets, brochures, posters) and perhaps billboard advertisements.</p> |
| <p>2- Use of cool colours in municipal roofs (municipal buildings and facilities)</p> | <p>Target Audience:</p> <ul style="list-style-type: none"> - Civil society, private and public stakeholders - Municipality staff - Schools and all other governmental facilities and staff - Professionals in energy sector - Government agencies and associations <p>Key Message:</p> <ul style="list-style-type: none"> - Saving energy will benefit the city at both environmental and economic levels by savings in the Municipality annual budget. <p>Objectives:</p> <ul style="list-style-type: none"> - Reduce air conditioning consumption in a cost efficient manner through the adoption of cool colours for the buildings' roofs (can cut cooling loads by up to 20%). The paint is easily applied on the building - Instigate commendably behaviour at home as in municipality. <p>Communication Tools:</p> <p>Information lectures for municipality employees with specific separate days for those dealing with procurement and electricity.</p> <p>Posters in all municipal buildings and facilities.</p> <p>Dissemination of information via municipal intra-net.</p> <p>Production of information posters what is the new paint, why it's being applied, how much does it save in electricity, in co2 emissions compared to the former state of the roof.</p> <p>Educational activities in schools where the roofs have been treated (explanation on savings, calculation assignments, drawing assignments etc.) It is important that the schoolchildren using the building every day will know why the roofs have been treated.</p> |
| <p>3- Campaign for old ACs, lamps and fridges substitution in residential sector</p> | <p>Target Audience:</p> <ul style="list-style-type: none"> - Civil society. - Private and public sector. - Touristic sector. <p>Key Message:</p> <ul style="list-style-type: none"> - Domestic appliances can eat up all your savings: there are better solutions. <p>Objectives:</p> <ul style="list-style-type: none"> - Reduce domestic bills. - Create a change of purchase behaviour by raising awareness on EE and through incentives provided by the municipality and the Ministry of Energy. - Promote the installation of similar equipment in other urban |

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| | <p>common areas - both public and private – through a renewable energy equipment forum aimed at relevant stakeholders.</p> <p><u>Communication Tools</u></p> <p>Information days for citizens on the importance of purchasing new and EE appliances (Energy labels).</p> <p>Creating a list of recommended appliances, and where they can be bought with the subsidies; -creating the system where the subsidies will be distributed to the largest number of households, making sure the application is only in the city of Ramla.</p> <p>Advertising on municipal website, local newspaper, schools, local radio (in Hebrew, and in Arabic for the relevant neighbourhoods).</p> <p>All actions will be accompanied by visual information – in appliances shops, on electricity exchange boxes, in the municipal and local media.</p> <p>Fact sheet information attached to the municipal-tax bill sent by post to each and every household.</p> <p>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 (the most inefficient, better maintenance of the A/C system).</p> <ul style="list-style-type: none"> • Production and dissemination of fact sheets that will include data on the importance of EE, its target, the advantages of LED, savings expected in %, etc. • Create an info center to inform citizens about new technologies. |
| <p>4- 10% voluntary commitment campaign in tertiary sector</p> | <p><u>Target Audience:</u></p> <ul style="list-style-type: none"> - Residential sector (building users, as well as building operators). - Schools (teachers, directors, students). - Business and shops owners. - Religious leaders. <p><u>Key Message:</u></p> <ul style="list-style-type: none"> - You can be a pioneer and become energy friendly. - Reduce your facilities' energy and carbon footprint, and more importantly, reduce your electricity bill. <p><u>Objectives :</u></p> <ul style="list-style-type: none"> - Provide concrete examples of good practices and successful operations - to organize a monitoring and a regular communication of the operation achievements. - Inform the building users to make them aware of their possibilities of actions and induce them to act out. - Insure a contact with all building users, thanks to meetings and contact person in each department making easier the dissemination of information. - Make the actions visible by providing feedback on their results - to increase the standing of the committed users. |

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| | <p><u>Communication Tools</u></p> <p>Competition between homes, between neighbourhoods; SMEs will fill an application form to participate. At the beginning and at the end of the year, the users will submit their electricity bills to prove at least a 10% of energy savings.</p> <p>The municipality will organize 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 (see action developed in template 2).</p> <p>An additional reward for those achieving the target will be the introduction 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.</p> <p>Launch of residents’ campaign: information lectures, conferences, radio programs, working groups (5-7 meetings) and longer courses for those interested.</p> <p>Creation and dissemination of brochures with saving tips.</p> <p>Launch of AR campaign in schools (for parents): stickers for lights, posters, educational movies on how to reduce electricity consumption.</p> |
| <p>5- Cycling promotion and creation of related infrastructure in transportation sector</p> | <p><u>Target Audience:</u></p> <ul style="list-style-type: none"> - Civil society, specifically young people. - Private and public touristic operators. <p><u>Key Message:</u></p> <ul style="list-style-type: none"> - A cleaner environment for your children. <p><u>Objectives :</u></p> <ul style="list-style-type: none"> - Reduce the fuel consumptions and congestion. - Increase sustainability. - Create a balanced, multimodal transportation system to give people choices about how to get to their destinations. - Increase roads capacity and traffic optimization for a better quality of life and economic stability. - Encourage car sharing, promoting active modes of transport especially walking and cycling, and providing safer conditions for the users to help change of behaviour. <p><u>Communication Tools</u></p> <p>This particular action is a quite ambitious initiative, intended to expand to the 2030 horizon and requires external financing for its implementation. It focuses on three distinct levels for the promotion of cycling in the region:</p> <p>Extensive dissemination activities, through information campaigns on the benefits of cycling such as flyers, brochures, 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.</p> |

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| | <p>Promote the creation of the necessary cycling infrastructure (bicycle lanes) across the road network of Ramla and launch of bicycle days.</p> <p>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.</p> <p>Design and distribute a touristic map (tourists' sites, restaurants, special fairs, cycling routes, etc.).</p> <p>Communicate through local associations, local radio messages and interaction with guests. Communicate with social media to grab people's opinions.</p> |
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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 communities' 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 Ramla specifically, awareness-raising should be carried out on several fronts to encourage, motivate and alert civil society.

On one hand, the target groups that have little engagement and involvement in the development of the renewable energies process towards a sustainable path will be given enough care in finding out the obstacles that need to be overcome; effective building up a know-how, experience sharing, concrete knowledge on how to use energy efficiently and the environmental impacts linked to energy consumption would be the best way to anticipate the barriers that affect their choices and preferences.

On the other hand, it is essential for each and every household to become mindful of the many ways they could help, through awareness and message-spreading, and a continuous nurturing process of the younger population.

Ramla municipality is an active force, setting various challenges and aiming at meeting them. However, while it is putting in place a comprehensive programme of measures it will need to communicate its exemplary role via its local media; The municipality will therefore show leadership by example by demonstrating new, energy-efficient technologies in its buildings, vehicles, office supplies and other energy-using equipment, and adopting procurement guidelines for their services.

It needs to assess the perception of options it offers to her citizens as viable and sustainable alternatives that will benefit them; use the adequate medium to deliver its message and lead the people in their choices towards a change in behaviour, enabling individuals to make informed decisions. Awareness-raising should be carried out in an interconnected manner between the municipality and its citizens to create cohesion and therefore persuasion concerning the ongoing projects and the future ones.

Therefore, it is important to use a leverage, on which the communication can be based upon such as the following ideas.

Develop consumer feedback, with smart meters, improved energy bills or various calculators to provide them with a better view of how their energy use impacts the environment as well as suggestions on how they can reduce their energy use. Creating a small fact sheet to be added to the

energy bill, that provides comparative consumption data to different consumer groups for the most significant energy consumption will both raise awareness and trigger action.

Use the several available internal communication means of the municipality to propose to the building users to use a part of the savings for something they choose (sharing of the savings, improvement of the building, donation to charitable organizations) - to perpetuate the changes by the monitoring and the communication on the results.

Formation of an energy team (such as the housekeeping personnel) to follow-up the equipment left off during the night; Organize a contest is also a good way to stimulate the realization of operations and to encourage experience sharing and creating an award for the best energy savings suggestions;

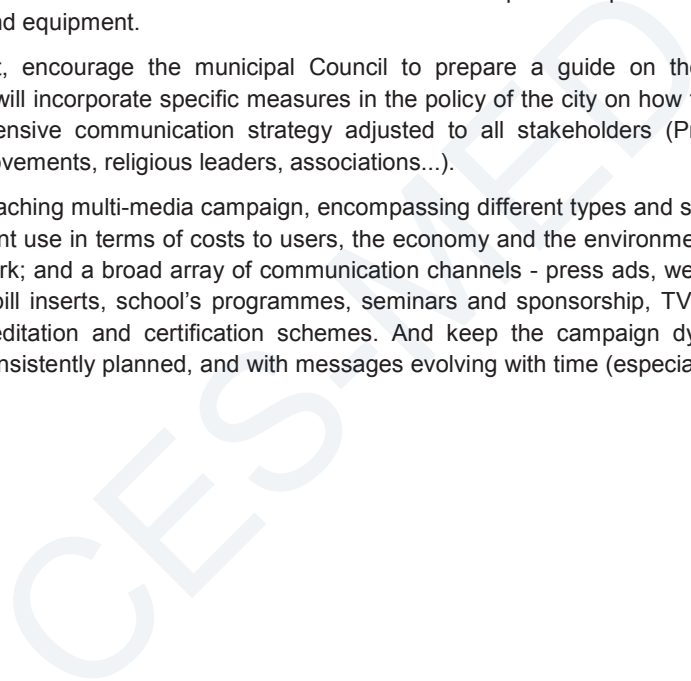
Include education and training plans and programmes for energy managers in industry and utilities, teaching aids for primary, secondary and vocational educational curricula.

Networking is another efficient tool for experience sharing: promote networking amongst municipal staff and/or other cities to ensure financing of best practices in energy efficiency, create an international network for dissemination of information and advice on efficient technologies.

Consider costs and benefits of tax credits as incentives for enterprises to promote the purchase of such appliances and equipment.

Last but not least, encourage the municipal Council to prepare a guide on the communication component which will incorporate specific measures in the policy of the city on how to reduce energy; Adopt a comprehensive communication strategy adjusted to all stakeholders (Professional, head teachers, youth movements, religious leaders, associations...).

Implement a far-reaching multi-media campaign, encompassing different types and sources of energy; impacts of inefficient use in terms of costs to users, the economy and the environment; best practices at home and at work; and a broad array of communication channels - press ads, website, road show, direct mail, utility bill inserts, school's programmes, seminars and sponsorship, TV-programme, and qualification, accreditation and certification schemes. And keep the campaign dynamic thanks to various actions, consistently planned, and with messages evolving with time (especially adapted to the seasons).





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