REVERSE ENGINEERED MATERIALS

Harnessing Energy to the Environment

Impact assessment

National Goals Index

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Introduction

Purpose of the work:

The purpose of this work is to assess the **future potential** impact of REM activity for achieving Israeli national and international sustainability goals. This assessment refers to the annual potential impact expected from the activities of REM in accordance with the expected scope of activity. The assessment is based on data derived from an LCA analysis performed by AFRY[1] .In addition, the assessment is based on various assumptions (data and forecasts), which originate from visible sources of information.

The process of examining this index included three stages:

1. Examination and selection of national and international sustainability goals relevant to REM's activity.
2. Modeling and estimation of the potential contribution expected to achieve these goals.
3. Analysis of the results and extrapolating conclusions derived from them.

[1] European consulting company specializing in infrastructure, industry, energy and digitalization creating sustainable solutions.

Greenhouse gas emission goals

Defining scenarios

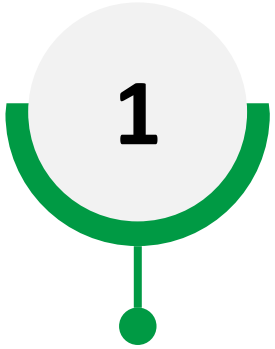
The assessment of the impact for this index was carried out according to two possible scenarios, depending on the mix of fuels used in the economy that will be used:

Scenario 2

Future fuel mix (including REM)

The future mix of fuels in the energy sector according to expected trends, including the activity of REM.

Half a million tons of ash will be used for the cement industry and **half a million tons** will be used for the rehabilitation of the mine from which oil shale was mined



Scenario 1

Current fuel mix (including REM)

The current mix of fuels in the energy sector, including the activity of REM

Half a million tons of ash will be used for the cement industry and **half a million tons** will be used for the rehabilitation of the mine from which oil shale was mined

The Israeli climate law 2021

(in accordance with Israel's NDC for the Paris Convention)

Goal details

Year of adoption:
July 2021

Type of decision:
Government decision

Responsible party:
Inter-ministerial, Ministry of Environmental Protection

Fields of goals:
Reduction of waste treatment emissions

Target years:
2050 ,2030

Emissions goals

85% reduction of **total greenhouse gas emissions** by 2050 and 27% reduction by 2030, with the base year being 2015

-85%

A 56% reduction in greenhouse gas emissions **from industry** by 2050 and a 30% reduction by 2030, with the base year being 2015

-56%

Waste emission targets

A 92% reduction in greenhouse gas emissions from **solid waste** by 2050 and a 47% reduction by 2030, with the base year being 2015

-92%

Reducing **municipal waste disposal** by 71% by 2030, with the base year being 2018

-71%

Every year, a report is submitted to the Knesset Interior and Environmental Protection Committee on the implementation of the plan and the rate of reduction of greenhouse gas emissions, and a forecast for the rate of greenhouse gas emissions in the coming years.

REM's contribution to reducing greenhouse gas emissions

Scenario 2 **Future fuel mix (including REM)**	Scenario 1 **Current fuel mix (including REM)**
Compared to the current situation without REM's activity, REM's activity will **reduce** greenhouse gas emissions at per year:	
59,820 $MTCO_2$-e	**131,920 $MTCO_2$-e**
Reducing these emissions accounts for	
0.3%	**0.6%**
From the national goal of **reducing** greenhouse gas emissions by **2030**	
0.1%	**0.2%**
From the national goal of **reducing** greenhouse gas emissions by **2050**	

Scenario 2 **Future fuel mix (including REM)**	Scenario 1 **Current fuel mix (including REM)**
Compared to the current situation without REM's activity, REM's activity will **reduce** greenhouse gas emissions at per year:	
59,820 $MTCO_2$-e	**131,920 $MTCO_2$-e**
Reducing these emissions accounts for	
2.3%	**5.1%**
From the national goal of **reducing** greenhouse gas emissions by **2030**	
1.2%	**2.6%**
From the national goal of **reducing** greenhouse gas emissions by **2050**	

REM's contribution to reducing greenhouse gas emissions resulting from **waste treatment**

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Goal details

Year of adoption:
December 2020

Type of decision:
Ministry vision

Responsible party:
Ministry of Energy

Fields of goals:
Reducing emissions

Target years:
2050 ,2025

Emissions goals

Reduction of 80% greenhouse gas emissions **from the energy sector** by 2050 (level 12.3 MtCO2e) when the base year 2015 (level 37.11 MtCO2e)	**-80%**
Reduction of between 75%-85% greenhouse gas emissions **from the electricity generation sector** by 2050 with the base year being 2015	-80%
Electricity generation from renewable energy sources by 2030	30%
Use of coal in the electricity generation process by the end of 2025	0

The emissions reduction goals in the energy sector relies on meeting the emissions reduction goals of complementary economies such as the transport sector and the industry sector.

A vision for the energy sector, led by the Ministry of Energy

Scenario 2	Scenario 1
Future fuel mix (including REM)	**Current fuel mix (including REM)**

Compared to the current situation without REM's activity, REM's activity will **reduce** greenhouse gas emissions at per year:

59,820	**131,920**
$MTCO_2$-e	**$MTCO_2$-e**

Reducing these emissions accounts for

0.2%	**0.5%**

From the national goal of reducing greenhouse gas emissions in the energy sector **by 2030**

REM's contribution to reducing greenhouse gas emissions in the **energy sector**

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Air pollutant emission goals

Goal details

Year of adoption:
March 2022

Type of decision:
Government decision

Responsible party:
Inter-ministerial, Ministry of Environmental Protection

Fields of goals:
Reducing pollutant emissions

Target years:
2030

Emissions pollutants goals

A **48% reduction in sulfur dioxide (SO2)** emissions by 2030, with the base year being 2018 **-48%**

An **18% reduction in nitrogen oxide (NOx)** emissions by 2030, with the base year being 2018 **-18%**

A **reduction of 9% in emissions of PM_{10} particles and 12% in emissions of $PM_{2.5}$** particles by 2030, with the base year being 2018 **-9-12%**

An **8% reduction in emissions of volatile organic compounds (VOCs)** by 2030, with the base year being 2018 **-8%**

A **32% reduction in benzene** emissions by 2030, with the base year being 2018 **-32%**

A national plan to prevent and reduce air pollution and greenhouse gas emissions

REM's contribution to reducing air pollutant emissions

Scenario 2 Future fuel mix (including REM)			Scenario 1 Current fuel mix (including REM)		
376 tone PM	1,134 tone NO_x	2,545 tone SO_2	260 tone PM	884 tone NO_x	3,016 tone SO_2

Compared to the current situation without REM's activity, REM's activity will **reduce** greenhouse gas emissions at per year:

Reducing these emissions accounts for

71.8%	3.6%	13.1%	49.6%	4.6%	15.5%
Reducing the increase[2] in **PM** emissions until **2030**	From the goal of reducing **NO_x** emissions by **2030**	From the goal of reducing **SO_2** emissions by **2030**	Reducing the increase[2] in **PM** emissions until **2030**	From the goal of reducing **NO_x** emissions by **2030**	From the goal of reducing **SO_2** emissions by **2030**

Expected emissions by 2030	PM	No_x	SO_2
Base year (2018)	31,568 tone	112,076 tone	45,040 tone
Business as usual (2030)	32,092 tone	87,271 tone	25,552 tone
Expected change (without REM's activity)	**+524 tone**	**-24,805 tone**	**-19,481 tone**

[2]In the examined scenario of the Ministry of Environmental Protection, there was an increase of 524 tons in PM air pollutant emissions between the base year 2018 and the year 2030. Without the activity of REM'S, this increase would be reduced by 260 tons in scenario 1 and 376 tons in scenario 2.

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Waste landfill reduction goals

Strategy for a Sustainable Waste Economy 2021–2030 (Circular Economy 2050)

Goal details

Year of adoption:
December 2020

Type of decision:
Ministry vision

Responsible party:
Ministry of Environmental Protection

Fields of goals:
Waste treatment

Target years:
2030

Waste goals

By 2030, no more than 20% of municipal solid waste will be **buried** — **20%**

By 2030, 54% of the total waste will be **transferred for recycling** — **54%**

By 2030, 70% of the **packaging waste** will be recycled — **70%**

The situation today

Today, 80% of municipal solid waste is buried in landfills — **80%**

Today, 14% of the total waste is recycled — **14%**

Today, 78% of packaging waste is recycled — **78%**

The goals detailed in this strategy are intended, among other things, to support Israel's transition to a circular economy by 2050 and to achieve the environmental goals specified in the Climate Law.

The Ministry of Economy's Vision for Industry and Waste

Goal details

Year of adoption:
December 2019

Type of decision:
Ministry vision

Responsible party:
Ministry of Economy

Fields of goals:
Reducing waste treatment emissions

Target years:
2050

Emissions goals

40% reduction in **industrial greenhouse gas emissions** by 2050, with the base year being 2015

-40%

Waste goals

Recycled mixed municipal waste	**60%**
Mixed municipal waste **landfilled**	**0**
Recycled construction waste	**100%**

Specified measures to achieve the goals

- **recycling technologies**
- Process emissions reduction
- Efficient energy use
- Use of hydrogen
- Electrification and renewable energy

REM's activity is expected to treat about 200,000 tons of plastic waste annually. This treatment diverts waste from landfills and promotes national goals for reducing landfills.

Diversion of 200,000 tons of waste from landfills constitutes a contribution of

4.1%-3.8%

From the goal of the Climate Law and the Sustainable Waste Economy Strategy to **reduce landfill waste**

2.9%-2.7%

From the Ministry of Economy's goal of **zero landfilled waste**

REM's contribution to reducing landfill waste

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Our basic assumptions

During the building of the impact assessment model and data analysis, several which formed a computational basic assumptions were taken into account infrastructure for the final results. The correctness of the assessment depends on the validity of these assumptions:

- The production volume of the facility will be 219,566 tons of oil per year.
- The plastic waste treatment volume of the facility will be 200 thousand tons per year.
- In the target index for reducing air pollutants, the calculation of REM's contribution is based on a comparison between the base year (2018) and the year 2030 in the Business As Usual scenario of the Ministry of Environmental Protection.
- Between 60-65 of the plastic waste treated by REM will come from a mixed municipal waste source.
- All of the waste treated by REM would have been transferred to landfills in the absence of the company's activity.
- Half a million to a million tons of the ash created as a byproduct of the company's operations will be used for the cement industry and for the restoration of the mine from which oil shale was mined.

Appendices

National Goal: Climate Law 2021

A government decision made in July 2021 sets national goals on environmental issues. The goals set relate to the issues of emissions, waste, and energy and aim for 2050, with interim goals in 2030.

National Goal: Sustainable Waste Economy Strategy 2021–2030 and Circular Economy Transition by 2050

The strategy, formulated in December 2020 and administered by the Ministry of Environmental Protection, addresses the issue of waste treatment in Israel and sets goals regarding the collection, treatment, recycling and disposal of waste. The strategy sets goals for Saturday 2030, with the aim of moving from a linear economy to a circular economy by 2050.

National goal: a vision for the energy sector, led by the Ministry of Energy

In order to reduce the negative environmental effects of the energy sector, in December 2020, the Ministry of Energy formulated a vision and plan for the transition to sustainable energy production and utilization, with goals for 2050.

National goal: The Ministry of Economy's vision for the field of waste

In order to promote a low-carbon and air pollution industry, the Ministry of Economy formulated a plan and vision for the field of waste that emphasizes the transition to a circular economy, while optimizing waste treatment methods.

National goal: A national plan for the prevention and reduction of air pollution

In order to reduce the health effects arising from air pollution, as well as the resulting financial costs, the government formulated a plan to reduce emissions of major air pollutants until the year 2030.

International goal: Paris Convention

As part of Israel's commitment to the Paris Convention, to which it is a signatory, in July 2021 an updated NDC (Nationally Determined Contributions) document was submitted detailing a variety of final and intermediate goals relating to greenhouse gas emissions, energy, and waste and its treatment.

Appendix A: Details of selected national and international goals