



Impact assessment for REM

Assessment of potential contribution of REM activities on public expenditure reduction on healthcare

December 2021

Introduction

Work Scope:



The purpose of this work is to assess the future potential impact of REM activity on public expenditure on healthcare. The assessment is based on data derived from an LCA analysis performed by AFRY¹. In addition, the assessment is based on various assumptions (data and forecasts), which are derived from public information sources and internal assessments.



This assessment does not examine the environmental impacts of pollutants emission that do not directly affect public health in the near term. We thank **Deloitte Israel** for their assistance in preparing this analysis.



1. Conducting research on relevant topics, such as the external cost of pollutants emission on public health in Israel and around the world.
2. Building an economic model in order to assess the potential impact
3. Analyzing the data obtained from Afry. Optimizing the model according to the findings
4. Analyzing model results and their meanings



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

Assessing the impact on healthcare cost savings

The impact assessment is based on three possible scenarios: high, medium and low.

The division into three scenarios is an acceptable methodology in the field of pricing the external costs of pollutants. The scenarios are based, among other things, on the realization of health damages. The cost of low and medium scenarios represent certain damages while the high scenario includes the realization of both certain and uncertain damages.

Given the basic assumptions and available data, we estimate the potential impact of REM activities on healthcare costs savings as follows:



High scenario

NIS 431.2 million

Annual savings for the health system,
attributed to pollutants reduction



Medium scenario

NIS 277.6 million

Annual savings for the health system,
attributed to pollutants reduction



Low scenario

NIS 196.6 million

Annual savings for the health system,
attributed to pollutants reduction

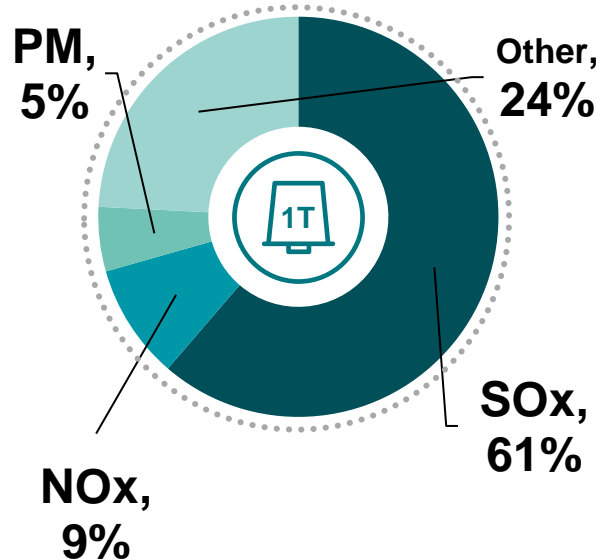
Assessing the Impact on Health Cost Savings

According to AFRY's data, the annual emissions savings of REM's activities are estimated at about 4,077 tons of pollutants, of which 99.6% are air pollutants.

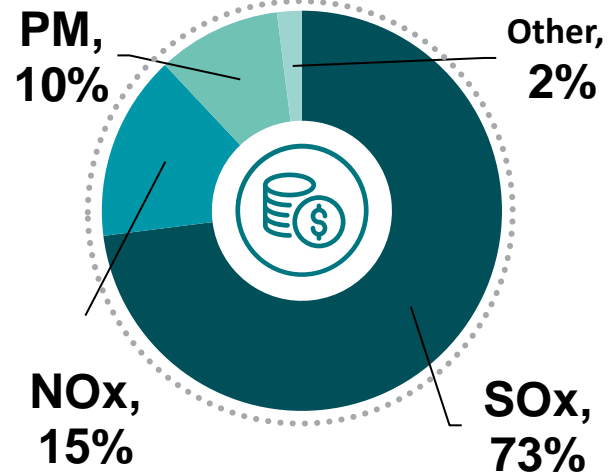
Different types of pollutants are attributed to different health costs.

While SOx emissions reduction is the major part of the savings, the ratio of economic savings to its weighted savings stands at just 1.18. In contrast, the ratio of PM economic reduction to weighted savings stands at 1.85 so each ton of PM reduction is more efficient than a ton of SOx in reducing health care expenditure. Among emissions in the "other" classification, the ratio is particularly low - 0.09. This is due to the relatively low external cost of CO (carbon oxide) emissions, which contribute about 90% of this classification.

Segmentation of pollutants by their potential weight reduction



Segmentation of pollutants by potential economic savings





Our base assumptions



During the preparing of the impact assessment model and data analysis, a number of basic assumptions were taken into account that formed a computational basis 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 external costs of water pollutants on public health in the Netherlands in 2015 are realistically equal to their cost to Israel in 2021.
- The cost of pollution of unspecified PM particulate matter emissions from the plant's operations is equal to the cost of the particulate matter particles with the highest external cost (PM_{2.5})
- The external costs of sulfur oxides emissions will be calculated according to the external cost of sulfur dioxide (SO₂).
- External cost analysis includes the types of pollutants listed in AFRY's LCA only.
- The costs of some of the materials listed in AFRY's LCA do not appear in the external cost pricing of pollutants in Israel and other countries. As a result, these materials were not included in the cost calculations, whether the results showed a reduction or increase in pollutants emissions (details in Appendix A).



Key sources of information:



- Pollutant reduction data from the LCA provided by AFRY
- External cost data of air pollutants from the Ministry of Environmental Protection
- External cost data for water pollutants from CE DELFT, an environmental consulting company in the Netherlands.



Appendix A - Uncalculated Materials

Some of the materials listed in AFRY's LCA data were not included in the external cost calculations. These substances do not appear in the pricing external costs of pollutants in Israel and other countries.

The following is a list of these materials:

Emissions saved as a result of REM activities:

- Acetic Acid ($C_2H_4O_2$) - **saving** 73.22 tons to the air
- Hydrogen sulfide (H_2S) - **saving** 15.9 tons to water
- Methanol (CH_3OH) - **saving** 28.3 tons to the air
- Sulfur trioxide - SO_3 - **saving** 5.9 tons to the air

Emissions added as a result of REM activities:

Hydrogen sulfide (H_2S) - **an addition** of 4.5 tons to the air