CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD)
Version 03 - in effect as of: 22 December 2006

CONTENTS

Annexes

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.
03	22 December 2006	• The Board agreed to revise the CDM project design document for small-scale activities (CDM-SSC-PDD), taking into account CDM-PDD and CDM-NM.

SECTION A. General description of small-scale project activity

A.1 Title of the small-scale project activity:

Bromine Compounds Fuel-Switch Project
Version 01
October 2007

A.2. Description of the small-scale project activity:

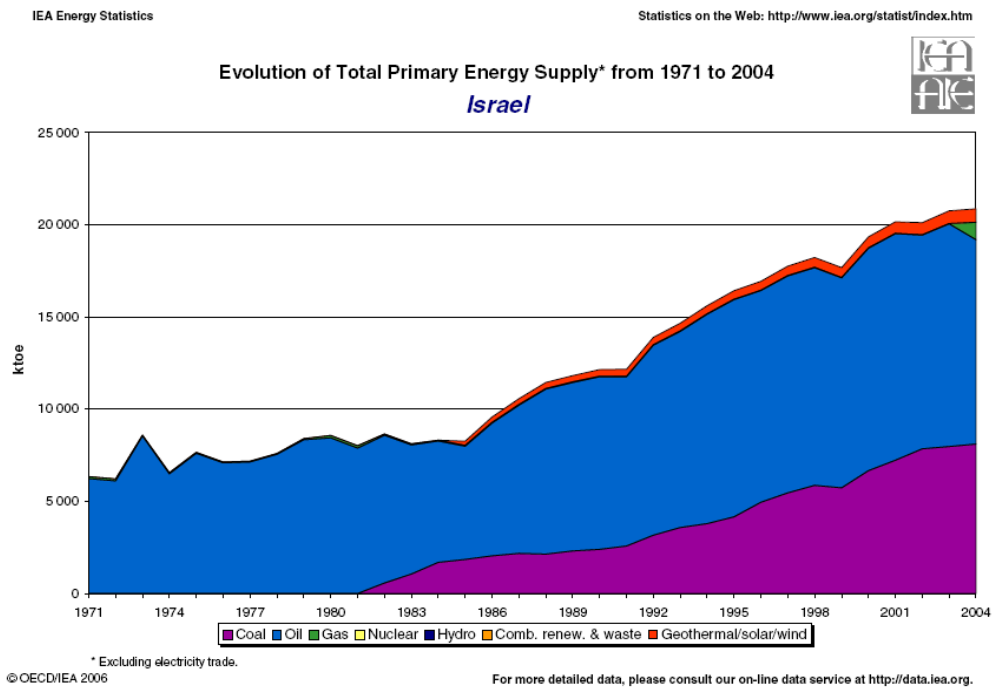
The Bromine Compounds plant was established in the Ramat Hovav industrial zone in Israel's Negev desert in 1978. The Bromine Compounds plant manufactures bromine products that are used for industrial and agricultural products. The plant operates to the highest standard and has a number of ISO certifications.

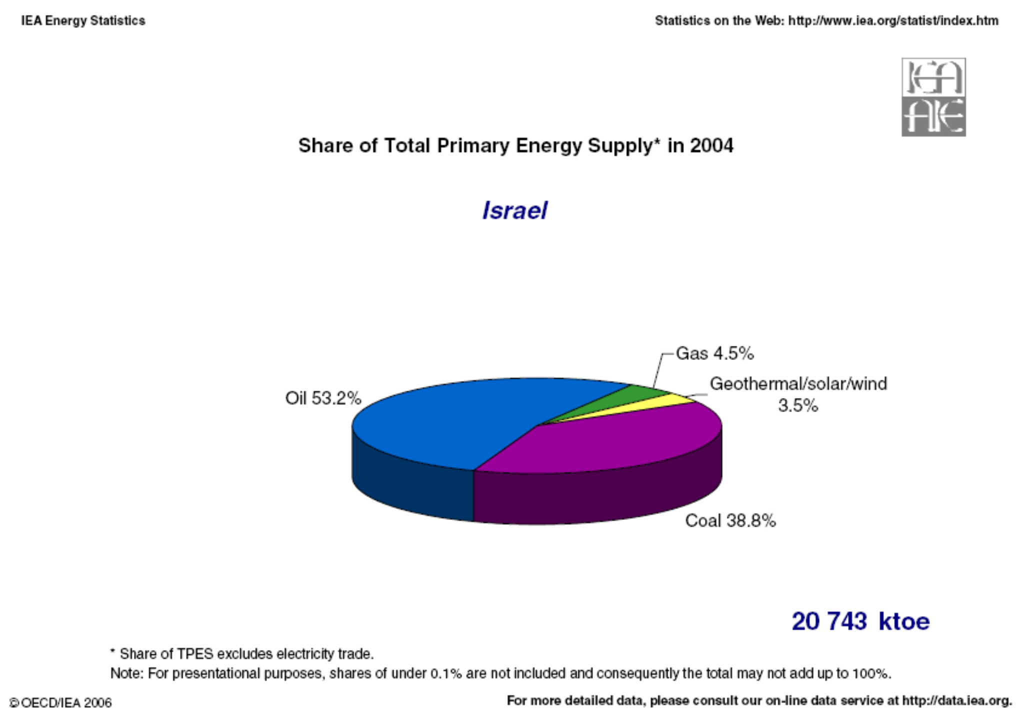
The project activity is a fuel switch in the main steam boilers from heavy fuel oil (HFO) to natural gas at the Bromine Compounds factory. Prior to the CDM project, the factory operated on HFO. The switch to natural gas will reduce the greenhouse gas emissions produced by the factory and by the Host Country. In addition, natural gas produces fewer air pollutants than HFO, which will also contribute to improved air quality in the regions.

Bromine Compounds operates to high international standards and has a number of ISO certifications.

Natural gas is not commonly used by industry in Israel for any type of energy generation. Israeli industry tends to use petroleum oils for energy generation; the International Energy Agency estimated that in 2004, oil made up 53% of Israel's primary energy supply.[1]

[1] Diagrams taken from the International Energy Agency (IEA), http://www.iea.org/Textbase/stats/pdf_graphs/ILTPES.pdf and http://www.iea.org/textbase/stats/pdf_graphs/ILTPESPI.pdf. According to the International Energy Agency TPES is calculated as indigenous energy products plus imports, less energy exports.





The government of Israel is committed to sustainable objectives and the project activity fulfils the following sustainability objectives:

Environmental

- The project will address climate change by reducing the amount of greenhouse gases (GHG) emissions generated from Bromine Compounds' production processes.
- The project will enable the factory to continue operation but with fewer air pollutant emissions, such as NOx, SOx and particulate matter, than it would in pre-project production.

Social

- Due to the use of a lower-carbon fuel such as natural gas, the project shall also achieve a reduction in harmful air pollutants such as SO_x, NO_x and particulate matter, which will produce health benefits.

Economic

- The project provides essential capacity building for Israeli industry because this project is among the first examples in Israel of private sector industry switching from petroleum oils to natural gas.

A.3. Project participants:

Name of Party involved (*). ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicates if the Party involved wishes to be considered as project participant (Yes/No)
Israel	Bromine Compounds Project Developer.	No
	EcoTraders Ltd. CDM project manager and consultant	No

A.4. Technical description of the small-scale project activity:

A.4.1. Location of the small-scale project activity:

A.4.1.1. Host Party(ies):

Israel

A.4.1.2. Region/State/Province etc.:

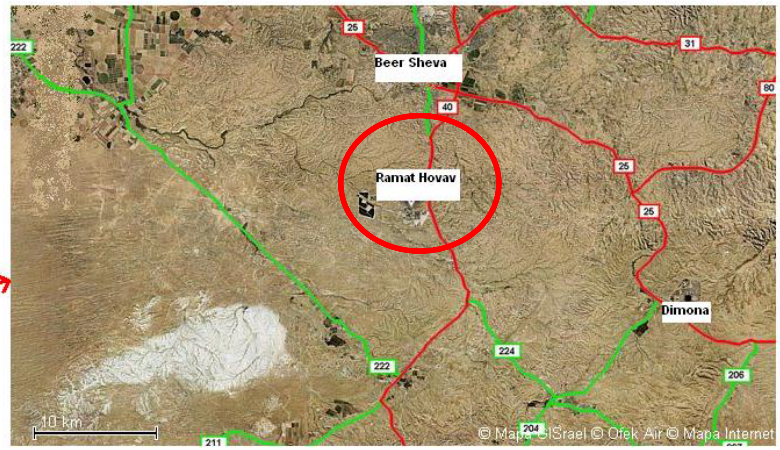
N/a

A.4.1.3. City/Town/Community etc:

Ramat Hovav Industrial Zone

A.4.1.4. Details of physical location, including information allowing the unique identification of this small-scale project activity :

Please see below.



The factory's address is the Ramat Hovav industrial zone, P.O.Box 180, approximately 12 kilometres from Be'er Sheva, the region's largest city.

A.4.2. Type and category(ies) and technology/measure of the small-scale project activity:

The project falls into Type III – Other project activities, and category B – Switching fossil fuels. The methodology III.B being used for the project is Version 12 (EB35).

The Bromine Compounds Fuel Switch project will switches the fuel the factory uses in its main steam boilers from heavy fuel oil (HFO) to natural gas. The project therefore falls into Sectoral Scope 1: Energy industries (renewable - / non-renewable sources).

Under Methodology III.B emission reductions must not exceed 60,000 tCO_2e annually. As shown below in sections A.4.3 and B.6 emission reductions from the fuel-switch project will be below this annual cap.

A.4.3 Estimated amount of emission reductions over the chosen crediting period:

Year	Annual estimation of emission reductions in tonnes of CO2e
2008	12,841
2009	12,841
2010	12,841
2011	12,841
2012	12,841
2013	12,841
2014	12,841
2015	12,841
2016	12,841

2017	12,841
Total estimate reductions (tonnes of CO2e)	128,410
Total number of crediting years	10
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	12,841

A.4.4. Public funding of the small-scale project activity:

The project will not receive any public funding from Parties included in Annex I of the UNFCCC.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity:

Appendix C, paragraph 2 of the Simplified Modalities and Procedures for Small-Scale CDM project activities states:

"A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure;
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point."

The project activity is being developed by Bromide Compounds, which confirms that it has not registered any small scale CDM activity in the past or applied for registration another small scale CDM project activity within 1km of the respective project boundary of the proposed project, in the same project category and technology/measure. Therefore, the Bromine Compounds Fuel Switch project meets the criteria that it is not a debundled component of a larger project.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity:

The project activity will use the approved baseline and monitoring methodology "III.B. Switching fossil fuels" (Version 12).

B.2 Justification of the choice of the project category:

The proposed project will replace HFO with natural gas. Methodology III.B, "Switching fossil fuels" was chosen for two reasons:

1. The primary activity in this project is a fuel-switch (HFO natural).
   The methodology applies to projects that are switching their fossil fuel consumption to a different fuel source.

2. Primary factory output to be used as a variable.
   The methodology requires that the facility's output be monitored. In the case of the Bromine Compounds Fuel Switch project, the factory's primary output is steam. Steam output will be used as the output variable.

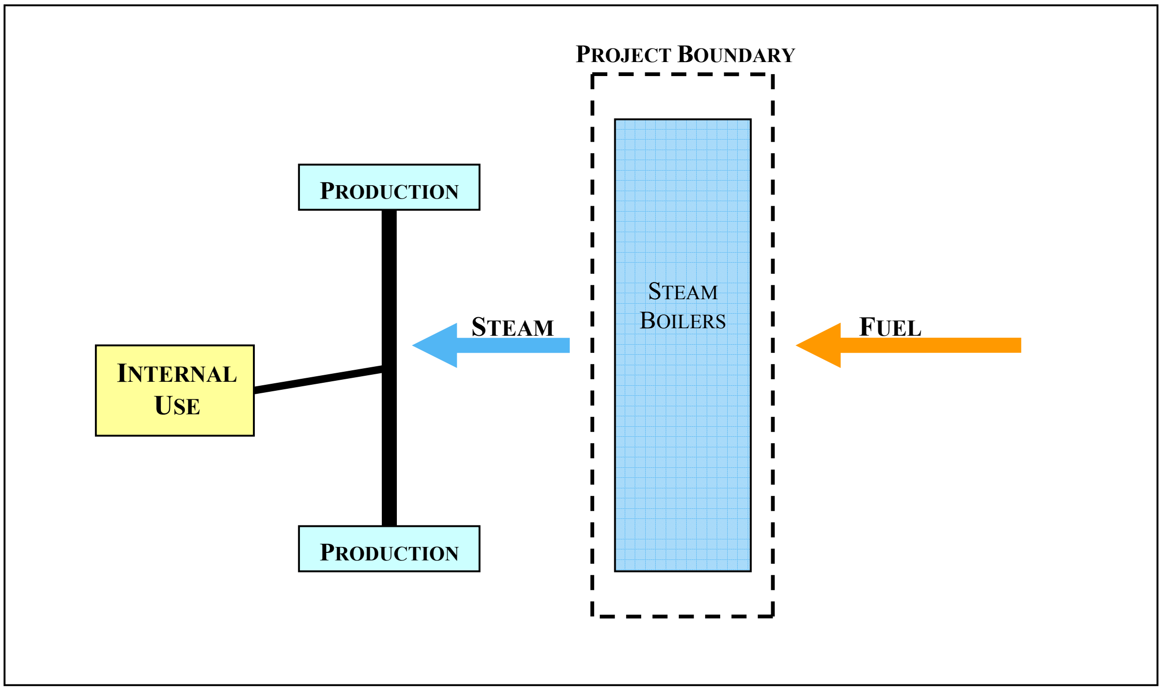
B.2.1 The small scale methodology III.B states that the baseline methodology is applicable to the following cases:

Applicability Clause	**Applicability of the clause to the small scale project activity**
"This category comprises fossil fuel switching in existing industrial, residential, commercial, institutional or electricity generation applications."	✓ The project is switching from the fossil fuel in the existing factory's main steam boilers from heavy-fuel oil, a fossil fuel to natural gas, a less carbon-intensive fossil fuel. Diesel may be used as a backup fuel when natural gas is not available.
"If the project activity primarily aims at reducing emissions through fuel switching, it falls into this category."	✓ The project is not expected to affect the efficiencies of the boilers.
"Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO2 equivalent annually."	✓ The project's emissions reductions will be less than 60,000 tCO_2e per year.

B.3. Description of the project boundary:

Methodology III.B states that "the project boundary encompasses the physical, geographical site where the fuel combustion affected by the fuel-switching measure occurs."

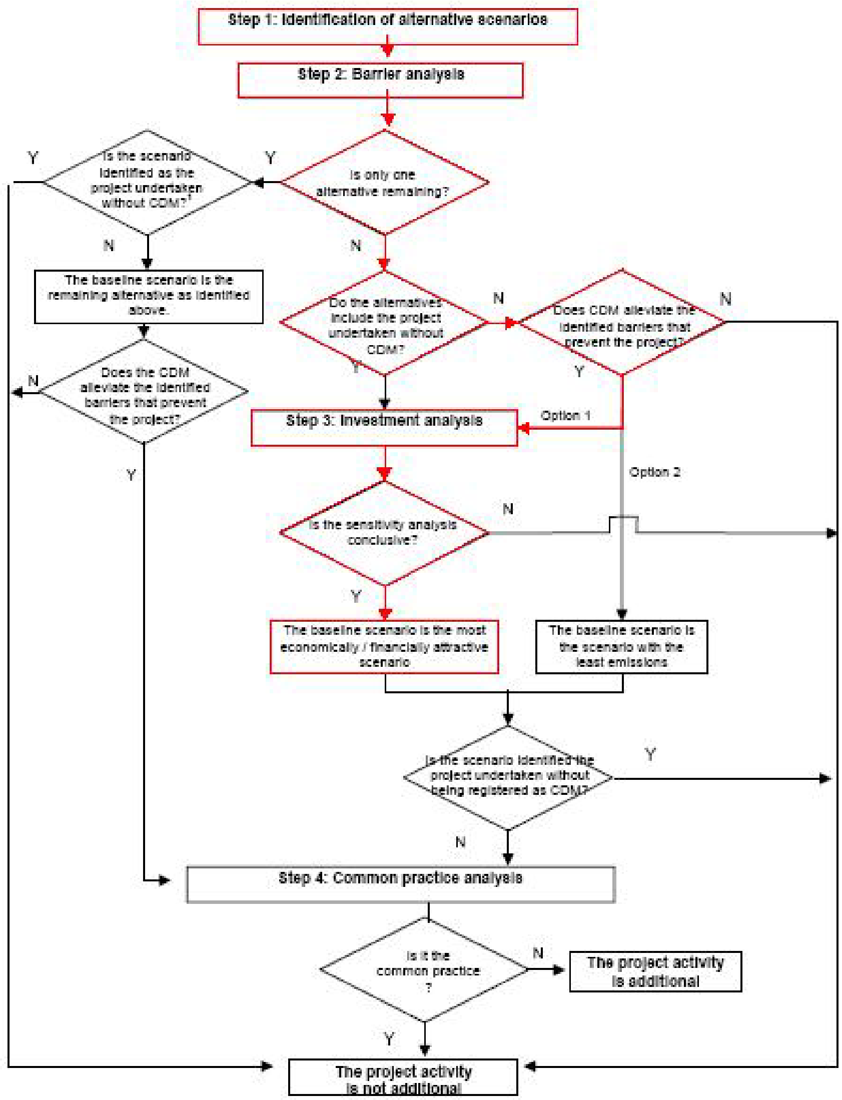
The physical, geographical site where the fuel-switching measure occurs is in the factory's steam boilers. Therefore, the factory's steam boilers are included in the project boundary.



B.4. **Description of baseline and its development:**

Methodology III.B does not specify how to choose the baseline scenario. Therefore, the baseline scenario will be selected by according to the "Combined tool to identify the baseline scenario and demonstrate additionality", but using only the first steps with the purpose of choosing the baseline scenario. The steps in the Tool used to determine additionality will not be used for this project. Rather, additionality will be determined according to the options provided in attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

The chart below illustrates the steps conducted to determine the appropriate baseline scenario for this project:



Step 1. Identification of alternative scenarios

Step 1a. Define alternative scenarios to the proposed CDM project

Alternatives:

1) Continuation of current practice – using HFO
2) Continuation of current practice – HFO with NO_x-elimination technology
3) Fuel switch – natural gas, without the CDM component
4) Fuel switch – natural gas, with CDM
5) Fuel switch to diesel

Alternatives (1) through (5) all provide comparable energy output and would allow the factory to continue production at the same level of quality.

Sub-step 1b. Consistency with mandatory applicable laws and regulations

At present there are no environmental standards or regulations in Israel relating to GHGs that restrict the continuation of HFO use at the factory. Israel has ambient air quality standards in place relating to SO_x, NO_x and particulate matter (PM). In addition, each industrial plant must maintain a business license where strict environmental standards are applied specifically to the plant. The Bromine Compounds factory does not quite meet its standards for NO_x. However, the factory has investigated the option that would allow it to continue using HFO and use Lextran technology to meet the NO_x standard. Therefore, alternatives (2) through (5) meet mandatory laws and regulations of the Host Country.

Alternatives:

1) ~~Continuation of current practice – using HFO~~
2) Continuation of current practice –HFO with NO_x-elimination technology
3) Fuel switch – natural gas, without the CDM component
4) Fuel switch – natural gas, with CDM
5) Fuel switch to diesel

Step 2. Barrier analysis

Sub-step 2a: Identify barriers that would prevent the implementation of alternative scenarios:

Technological Barriers

Because natural gas is a relatively new fuel in Israel and few facilities have experience in using it, the Bromine Compounds plant does not have the knowledge base for working with natural gas, such as operation and maintenance of equipment and troubleshooting problems. The plant had to invest in an extensive training program for all employees who are involved in production, operation and maintenance and will work with the natural gas. The training program involves theoretical and practical training and includes an in-class course and field training, with an exam that each employee must pass. The Bromine Compounds plant had to hire outside experts to develop and implement the training program. The Israel Electric Company, the largest company of engineers in Israel, was contracted to carry out the training of the plant's engineers. Welders on the plant's maintenance staff required special training to work with natural gas, because their work is made hazardous by natural gas, which may ignite due to the sparks caused by the welding process. There is no qualified company in Israel to provide welding training and a company from an Annex I country was contracted to provide this training.

The Bromine Compounds plant was required to invest capital and manpower hours to train its employees how to use the new technology – natural gas – and to seek Annex I country expertise to transfer technological knowledge to the Host Country. Without the specialized training, there would not be trained personnel to implement the natural gas fuel switch CDM project or to maintain the equipment and ensure continued levels of productions. It is clear that the project activity faces a technological barrier in the lack of trained personnel to implement and maintain the project activity.

Scenarios (3) and (4) face technological barriers.

Other Barriers – Uncertainty of fuel supply

The Bromine Compounds plant must invest time and capital in training its staff and in the installation of the natural gas infrastructure in the plant. These investments were been made prior to the closure on a contract with a natural gas supplier. Negotiations are ongoing with the natural gas supplier and as of October 2007, no contract has been closed.

Presently, there is only one likely natural gas supplier – Eastern Mediterranean Gas (EMG), whose natural gas is from Egypt. Although the Israeli and Egyptian governments are in negotiations, there has been opposition in Egypt to a deal with Israel to supply natural gas.[2] The other two suppliers in the region, Yam Tetis and British Gas, are not realistic sources of supply. Yam Tetis controls a small natural gas supply off the coast of Ashkelon but has already contracted most of the reserves to the Israel Electric Company and other companies; British Gas, located off the coast of Gaza, has not yet developed its infrastructure and it is estimated that gas will not be available until 2011, at the earliest.[3] Additionally, conflict between Israeli government and the Palestinian government in Gaza make it unlikely that a deal will be brokered unless significant political changes in the region occur.[4]

If EMG is unable to supply the contracted amount of gas in the short term, Bromine Compounds must purchase diesel as an alternative (backup) fuel for its boilers. Due to the high cost of diesel, Bromine Compounds can only use it as a backup fuel for a period of a few days. For longer breaks in gas availability, Bromine Compounds will likely return to using HFO, which would require re-outfitting the retrofitted boilers back to operate on HFO.

If EMG is unable to supply the contracted amount of gas in the long term, Bromine Compounds must find a new source of natural gas and enter negotiations with another natural gas supplier, which presents additional problems. A new contract will provide natural gas at market prices, which will increase Bromine Compounds's fuel purchase costs. Alternatively, Bromine Compounds can return to using HFO in its boilers and accept the loss of investment in the project.

Bromine Compounds expects to purchase gas from EMG in a "take-or-pay" contract, which mean that it will be locked into a contract with one natural gas supplier, which specifies the amount of fuel to be purchased and the length of time of the contract. This creates a disadvantage for Bromine Compounds compared to the current HFO consumption. In the event that Bromine Compounds opts not to use the gas, for whatever reason, it must still pay the natural gas supplier for the majority of the contracted amount of natural gas. Petroleum fuels, like HFO, allow the company flexibility in creating its fuel mix and placing fuel orders consistent with current fuel demand.

Alternatives (3) and (4) face technological and uncertainty barriers.

1) ~~Continuation of current practice – using HFO~~
2) Continuation of current practice – HFO with NO_x-elimination technology
3) ~~Fuel switch – natural gas, without the CDM component~~

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[2] "Egypt Faces Opposition Criticism Over Reported Israeli Gas Deal" Agence France Presse, May, 2004. http://findarticles.com/p/articles/mi_kmafp/is_200405/ai_kepm475192. Accessed July 15, 2007.
"Acting for Lebanon." *Al-Ahram Weekly*, August 10-16, 2006. http://weekly.ahram.org.eg/2006/807/re52.htm. Accessed October 1, 2007.
"Petrojet starts construction of Egypt-Israel gas pipeline in March" *The Daily Star*, February 14, 2007. http://www.dailystaregypt.com/printerfriendly.aspx?ArticleID=5591 Accessed on July 15, 2007.

[3] "Agreement to Purchase Natural Gas from British Gas – Within 2 Months", by Avi Bar-Eli. *The Marker*, May 13, 2007. http://www.themarker.com/tmc/article.jhtml?log=tag&ElementId=skira20070513_858610. Accessed July 15, 2007.

[4] "The Conflict in Palestine and its Repercussions on Gaza Gas Export to Israel" by Walid Khadduri. *Al Hayat*, July 2, 2007. http://english.daralhayat.com/business/07-2007/Article-20070702-868d3d59-c0a8-10ed-0082-a494eba38cc2/story.html. Accessed July 15, 2007.

4) ~~Fuel switch – natural gas, with CDM~~
5) Fuel switch to diesel

Impact of CDM Revenues
Bromine Compounds views CDM revenue as a sound and stable source of income, which will alleviate a portion of the risk the company faces in the realization of the project: investment of capital in training prior to certainty about gas delivery; production losses due to the retrofit of the facilities; and fuel supply risks in the future. The CDM revenues provide support to the Bromine Compounds plant in the face of the numerous risks that the introduction of natural gas poses.

Step 3. Financial Analysis
The Tool requires that if there is more than one option remaining for the baseline scenario selection that a financial analysis be conducted to determine which option is the most economically attractive. A financial analysis was conducted for the two remaining alternatives, scenarios (2) and (5). The analysis below will compare the costs of HFO and diesel.[5]

The cost of HFO per tonne and diesel per kilolitre (1000 litres) was taken from historical data available from the Central Bureau of Statistics. The cost of the NO_x-elimination technology was taken from the proposal submitted by Lextran Flue Gas Solutions. Using a density for diesel of 0.84 tonnes/kilolitre[6], the price per tonne of diesel was calculated, as shown in this table:

Year	Month	Refinery price of HFO NIS/tonne	Refinery price of HFO USD/tonne	Refinery price of diesel NIS/tonne	Refinery price of diesel USD/tonne
2005	I	752.3	171.81	1,793.57	409.61
	II	845.4	193.44	1,914.76	438.13
	III	905.4	209.15	2,048.93	473.30
	IV	1,055.70	241.50	2,220.95	508.05
	V	1,136.70	259.89	2,143.21	490.02
	VI	1,059.40	236.21	2,038.69	454.57
	VII	1,246.50	273.33	2,450.24	537.27
	VIII	1,210.10	268.36	2,399.05	532.02
	IX	1,294.20	285.17	2,726.43	600.75
	X	1,493.30	322.84	2,862.98	618.95

[5] Fuel price data in New Israeli Shekels (NIS) was taken from the Central Bureau of Statistics energy database. The data is available online in Hebrew. http://216.239.59.104/search?q=cache:l-y_2KZfRVYJ:www1.cbs.gov.il/energy+%D7%9E%D7%90%D7%92%D7%A8+%D7%90%D7%A0%D7%A8%D7%92%D7%99%D7%94&hl=en&ct=clnk&cd=3&client=firefox-a

, for petroleum products under "Data, Graphs and International Comparisons". Prices from the oil refineries (Bazan) is the source of this data.

Exchange rates to calculate USD from NIS is taken from the Bank of Israel. 2005 data: http://www.bankisrael.gov.il/deptdata/mth/average/averg05e.htm; 2006 data: http://www.bankisrael.gov.il/deptdata/mth/average/averg06e.htm.

[6] "Bioenergy conversion factors." Petro-diesel density (average) = 0.84 g/ml (=metric tonnes/m^3). http://bioenergy.ornl.gov/papers/misc/energy_conv.html.

	XI	1,428.00	303.84	2,716.90	578.09
	XII	1,271.20	275.65	2,419.88	524.73
2006	I	1,312.30	284.12	2,448.93	530.21
	II	1,553.50	330.31	2,716.31	577.54
	III	1,558.30	332.32	2,595.83	553.59
	IV	1,501.40	327.84	2,756.07	601.80
	V	1,523.90	340.61	2,954.40	660.35
	VI	1,512.80	338.26	2,907.02	650.01
	VII	1,428.30	322.21	2,914.64	657.52
	VIII	1,528.30	348.98	2,837.50	647.93
	IX	1,415.50	325.19	2,943.45	676.22
	X	1,142.20	267.31	2,396.90	560.96
	XI	1,165.50	270.99	2,409.40	573.45
	XII	1,125.10	267.78	2,430.00	545.27
Average		**1,269.39 NIS/t HFO**	**283.21 USD/t HFO**	**2,501.92 NIS/t diesel**	**558.35USD/t diesel**

The analysis of the prices listed in the chart above clearly indicates that there is an enormous difference between the price of HFO and diesel. To confirm that most financially attractive scenario is current practice, i.e. the continued use of HFO, a sensitivity analysis was conducted.

Using data of HFO consumption provided by the Bromine Compounds plant, it was determined that the following costs are faced by each of the alternative baseline scenarios. The prices for diesel and HFO, averaged from 2005 and 2006 data, were used. The amount of diesel that would have been required by the Bromine Compounds plant was calculated using the net calorific value (NCV) provided by the IPCC in its 2006 Guidelines for National Greenhouse Gas Inventories.[7]

Alternative 1	Continuation of current practice: 100% HFO + NO_x-elimination technology	$4,732,930
Alternative 4	100% diesel	$7,840,534

Alternative 1, the continuation of current practice, financially is the most attractive scenario.

Sensitivity analysis #1 – Price of HFO increases by 10%

Alternative 1	Continuation of current practice: 100% HFO + NO_x-elimination technology	Price of HFO +10%	$5,156,223
Alternative 4	100% diesel	No change in diesel price	$7,840,534

Sensitivity analysis #2 – Price of diesel decreases by 10%

Alternative 1	Continuation of current practice: 100% HFO + NO_x-	No change in HFO price	$4,732,930

[7] IPCC 2006. Vol.2, Ch.1, pg.1.18-1.19. Values given as TJ/Gg, but calculated here according to TJ/t (1Gg=1000tonnes).

	elimination technology		
Alternative 4	100% diesel	Price of diesel -10%	$7,056,480

In each case presented in the sensitivity analysis, current practice (HFO) remains the most attractive scenario.

The investment analysis of the combined tool requires that the baseline scenario that is selected be the most financially attractive option. Therefore, scenario (5) is eliminated.

1) ~~Continuation of current practice - HFO~~
2) Continuation of current practice – HFO with NO_x-elimination technology
3) ~~Fuel switch – natural gas, without the CDM component~~
4) ~~Fuel switch – natural gas, with CDM~~
5) ~~Fuel switch to diesel~~

The financial analysis clearly indicates that the baseline scenario is Scenario (2), the use of HFO with NO_x-elimination technology.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

To determine the project's additionality, the SSC-PDD requires that the project activity be assessed using the options in Attachment A to appendix B of the simplified modalities and procedures for small-scale CDM projects. Project participants must provide an explanation to show that the project activity would not have otherwise occurred due to the barriers described below; the alternative to the project activity would have led to higher CO_2e emissions.

The baseline scenario is the continued use of HFO in the Bromine Compounds factory. Therefore, it is not the project activity undertaken without CDM.

In order to fully understand the difficulties the Bromine Compounds fuel switch project faces, it is necessary to give some background on the Israeli energy sector. Energy in Israel is generated primarily from petroleum oils and coal. Up until now, natural gas has not been available for use in the energy and industrial sectors.

Since the mid-1980s, the Israeli government has intended that natural gas be introduced to the industrial sector. In 1995, the government established the Natural Gas Authority to promote the development of a natural gas infrastructure in Israel. The national plan for the installation of a natural gas pipeline (National Plan 37) was completed in 1999. The plan was to be implemented immediately upon its finalization, although actual implementation encountered a number of unforeseen obstacles, which delayed the introduction of natural gas to Israel:

1. The government published a tender with the intention that a single private body to construct maintain and operate the pipeline. After the tender failed in 2003, the government realized that only a governmental body could undertake a project of this magnitude. Israel Natural Gas Lines Ltd (INGL) was established to construct the natural gas pipeline and received a license to do so in 2004.

2. Construction of the pipeline began in 2004[8] but the pipeline project was delayed for a number of reasons. No natural gas transportation system has ever been constructed in Israel, which means that there was a lack of skilled and properly trained personnel to implement the project. Construction was delayed as well because it was difficult for the INGL to acquire the necessary building permits to construct the pipeline because local authorities, such as the Fire Authority and municipalities, were sensitive to the risks posed by a natural gas pipeline.

3. To date, only a minor part of the natural gas pipeline as planned has been installed, delaying further the arrival of natural gas to Israel. The yellow highlights on the map below illustrate the part of the natural gas pipeline that has been laid down.

4. To date, the pipeline to Ramat Hovav has not been completed. The constant delay in the supply of natural gas has caused endless difficulties for industries wishing to plan ahead and include natural gas in their fuel mix.

5. No pipeline is yet available from the EMG gas fields, from El Arish and Israel has no influence or impact upon its construction. Until the El Arish-Ashkelon pipeline is completed, there is no gas supply for the Bromine Compounds plant.

[8] Survey of the Natural Gas Sector in Israel. Conducted by Ma'a lot (the Israeli Company for Ranking Bonds). Accessed July 10, 2007. http://www.maalot.co.il/content.asp?PageId=229.

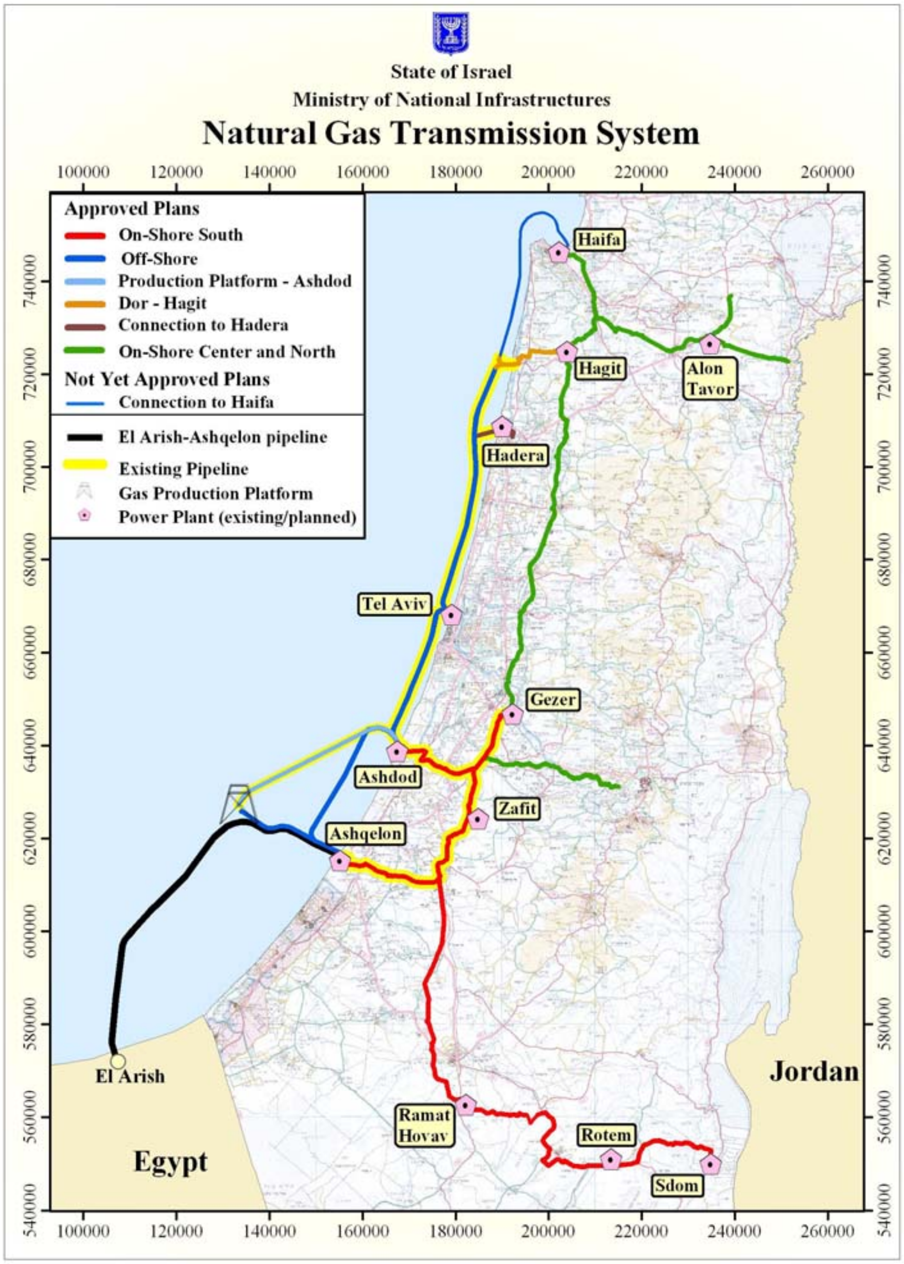

Figure 1: Natural Gas Pipeline in Israel, October 2007[9]

[99] Ministry of National Infrastructure. http://www.mni.gov.il/mni/en-US/Energy/NaturalGas/NGTransportation.htm. Accessed on October 16, 2007.

Barriers to the Project
Were the Bromine Compounds plant to continue operating using HFO the plant would not face the barriers described below and its emissions would be higher.

Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
This project is one of the first of its kind to be implemented in Israel in the private sector. There are only two other private users of natural gas in Israel, the Ashdod Refineries, which although privatized in August 2006, began using natural gas in November 2005 when it was still a government-owned company, and the American Israel Paper Mills factory, which has been developed as a CDM project

To appreciate the pioneering characteristics of this project it is necessary to understand how Israel's industrial sector generates energy. Israeli industry relies mainly on petroleum oils (heavy-fuel oil, diesel and naphtha) to generate heat and steam (see list in Annex 5). Up until now, natural gas has not been available for use in the energy and industrial sectors. In the absence of the project activity, the Bromine Compounds plant would have continued to use HFO, which has higher CO_2 emissions than natural gas. HFO is a common, standard fuel in Israeli industry and Bromine Compounds would have not faced any barriers if it had continued to use this fuel. As was stated in Section B.4, the Bromine Compounds plant meets its environmental obligations while using HFO and NO_x-elimination technology.

Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions.

Because natural gas is a relatively new fuel in Israel and few facilities have experience in using it, the Bromine Compounds plant does not have the knowledge base for working with natural gas, such as operation and maintenance of equipment and troubleshooting problems. The plant had to invest in an extensive training program for all employees who are involved in production, operation and maintenance and who will work with the natural gas. The training program involves theoretical and practical training and includes an in-class course and field training, with a test that each employee must pass. The Bromine Compounds plant had to hire outside experts to develop and implement the training program. The Israel Electric Company, the largest company of engineers in Israel, was contracted to carry out the training of the plant's engineers. Welders on the plant's maintenance staff required special training to work with natural gas, because their work is hazardous with natural gas. There is no qualified company in Israel to provide this training and a company from an Annex I country was contracted to provide this training.

The Bromine Compounds plant was required to invest capital and manpower hours to train its employees how to use the new technology – natural gas – and to seek Annex I country expertise to transfer technological knowledge to the Host Country. Without the specialized training, there would not be trained personnel to implement the natural gas fuel switch CDM project or to maintain the equipment and ensure continued levels of productions. It is clear that the project activity faces a technological barrier in the lack of trained personnel to implement and maintain the project activity.

Were Bromine Compounds not to implement the fuel-switch project, it would have continued to use HFO. There are numerous employees at the Bromine Compounds plant who have the expertise to work with HFO. No special training or contracting of services for training would have been required by Bromine Compounds if it were not implementing a new technology; emissions, however, would have been higher.

Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

Other Barriers – Uncertainty: Fuel Availability
Bromine Compounds faces uncertainty regarding the availability of the natural gas it has purchased, which can affect the company's production schedule and economic viability.

1. Bromine Compounds has had to invest in natural gas delivery infrastructure, safety equipment and training for its employees in anticipation of natural gas being available in 2008 from El Arish. The natural gas offshore transportation pipeline is to be constructed from El Arish in the northern Sinai to Ashkelon in southern Israel.

There gas pipeline in El Arish may have associated security risks. The fact that the El Arish pipeline will supply gas to Israel may make it a security target, given the political tensions in the region. If the natural gas delivery system is damaged and gas is not available for a period of time from EMG, Bromine Compounds will not have the option of other gas supplies with which to supplement its natural gas demand. Most of the Yam Tetis gas supply has been secured by the IEC and other companies through contracts. The British Gas supply will not be available until 2011, at the earliest.[10] Additionally, conflict between Israeli government and the Palestinian government in Gaza make it unlikely that a deal with be brokered unless there are significant political changes. The Bromine Compounds plant is investing a great deal of capital in a natural gas fuel switch, but the natural gas supply is less reliable than the current petroleum fuels used at Bromine Compounds. If the supply of natural gas fails, the factory may be forced to use diesel, which would entail lost investment in the project activity.

2. Gas contracts signed are take-or-pay contracts, which mean that the consumer and the supplier are locked into contract for a specific amount of time. This creates a disadvantage for Bromine Compounds compared to the current HFO consumption. In the event that Bromine Compounds opts not to use the gas, for whatever reason, it must still pay the gas supplier for the majority of the contracted amount. More traditional fuels, like HFO, allow the company flexibility in creating its fuel mix and ordering what is needed as it is needed.

Had Bromine Compounds not chosen to implement a fuel switch project it would have continued to use HFO, which is always available, can be ordered as needed and stored on-site and requires no commitment to any one supplier. The continued use of HFO instead of the project activity would have led to higher emissions.

Summary of barriers to the project activity:

Barrier	Bromine Compounds Fuel Switch (Project Activity)	HFO (Baseline Scenario)
Prevailing Practice	• Among the first projects of this kind in the Host Country • Majority of the industry in the Host Country uses petroleum oils to generate heat and steam.	• Commonly used fuel in Israel • Knowledge exists of how to use HFO in boilers • Factory only must manage its HFO supply inventory and place orders for deliveries as

[10] "Natural Gas Agreement with British Gas in Two Months", by Avi Bar-Eli. *The Marker Online,* May 13, 2007. http://finance.walla.co.il/?w=//1105962/@@/item/printer. Accessed August 23, 2007.

	• Special training needed for the factory to operate on natural gas.	needed • Factory needs no special knowledge or trained personnel to ensure that HFO supply is available
	Barrier to the implementation of the project.	*No barrier to the baseline scenario.*
Technological Barrier	• Special training needed for the factory to operate on natural gas. • Annex I expertise had to be contracted to provide certification for operation with natural gas.	• No special training would be needed to continue operations on HFO because the knowledge is available in-house.
	Barrier to the implementation of the project.	*No barrier to the baseline scenario.*
Uncertainty – Fuel Availability	• Fuel to be delivered by transportation system from a different country • Political tensions in the region may put the delivery of fuel at risk. • Contract one supplier to deliver natural gas – if another supplier is needed, will need to negotiate another contract. • If gas supply fails or is delayed, Bromine Compounds will need to use diesel fuel, which will mean loss of investment.	• HFO can be ordered from any one of a number of companies and is available in an unlimited supply, meaning no loss of production. • Should one fuel supplier company not be able to provide HFO, orders can be placed with a different fuel supplier. HFO is a fuel that can be stored on-site and its inventory managed.
	Barrier to the implementation of the project.	*No barrier to the baseline scenario.*

Continuing to use HFO would not have required the time and effort that Bromine Compounds has invested in the project and the barriers that it has faced and may face in the future:

- Being one of the first private companies in Israel to develop plans to switch to natural gas (prevailing practice barrier);
- Lack of trained personnel that required special training and contracting expertise from Annex I countries (technological barrier);
- Dealing with risk in natural gas supply and availability from one supplier in a region with political tensions (uncertainty barrier);
- Being limited to one supply of gas, which, if the supply fails, would necessitate returning to petroleum fuels, which would result in the loss of the investment in the project.
- Being limited to one gas supplier, in the event that a new contract must be negotiated due to supply problems, and problems with other suppliers in the region (uncertainty barrier);

Therefore, the project is additional because the baseline scenario, the continued use of HFO would not have faced the above barriers and would have led to higher emissions. Therefore, the project activity is additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

The approved small-scale methodology "III.B. Switching fossil fuels" demands the following in terms of emission reduction (ER) calculations:

Project Emissions:

"Project activity emissions consist of those emissions related with the use of fossil fuel after the fuel switch."

No equations are contained in the approved methodology and, therefore, project emissions shall be calculated according to the equation below, which was developed to meet the methodology's instructions.

$$PE_y = PE_{NG,y} + PE_{i,y} \qquad (1)$$

Where:

Parameter	Description	Unit
$PE_{,y}$	Project Emissions in year y.	tCO_2e/yr
PE_{NG}	Project Emissions from natural gas use in year y.	tCO_2e/yr
$PE_{i,,y}$	Project Emissions from non-natural gas fossil fuel use in year y.	tCO_2e/yr

Equation for project emissions from natural gas use:

$$PE_{NG,y} = FC_{PJ,NG} \times CF_{MMBTU \rightarrow TJ} * EF_{NG} \qquad (1a)$$

Where:

Parameter	Description	Unit
$FC_{PJ,NG}$	Fuel consumption in project scenario of natural gas	MMBTU/yr
$CF_{MMBTU \rightarrow TJ}$	Conversion factor to calculate the number of TJ per MMBTU	TJ/MMBTU
EF_{NG}	Emission factor of natural gas considering both the net calorific value and oxidation factor. (IPCC 2006)	tCO_2/TJ

Equation for project emissions from other fossil fuel use:

$$PE_{i,y} = \sum FC_{PJ,i,y} \times NCV_i * EF_i \qquad (1b)$$

Where:

Parameter	Description	Unit
$FC_{PJ,i,y}$	Fuel consumption in project scenario of fuel *i* in year y	Tonnes/yr
NCV_i	Net calorific value of fuel *i*	TJ/tonne
EF_i	Emission factor of fuel *i* considering both the oxidation factor. (IPCC 2006)	tCO_2/TJ

In this manner, each tonne of CO_2 emitted to the atmosphere in the project due to the consumption of fossil fuels is accounted for.

Fuel consumption of natural gas in project scenario will be measured according to the procedures described in the following section of the PDD. The estimations given in section B.6.3 for the ex-ante calculations are derived from internal demand projections of the plant. For simplicity, the ex-ante calculation also assumes that only natural gas will be used throughout the project activity.

The ex ante calculation of PE_y bases the parameter FC_i on the amount of energy required for production at Bromine Compounds during the lifetime of the project activity. It is assumed, for *ex ante* calculation purposes that production will equal the average production of 2004-2006. Actual fuel consumption and production levels throughout the project activity will be monitored as described in section B.7.1.

Baseline Emissions:

Therefore, baseline emissions shall be calculated as follows:

$$BEy = BE_{per\ unit\ output,BL} * P_{output,PJ,j}$$

Eq. 2a

Where:

Parameter	Description	Unit
BEy	Baseline emissions in year y.	tCO_2/yr
$BE_{per\ unit\ output,BL}$	Emission in the baseline per unit of output	tCO_2/tonne output
$P_{output,\ PJ,y}$	Output in project scenario in year y.	Tonne/yr

$$BE_{per\ unit\ output} = \frac{FC_{BL,i} * NCV_i * EF_i}{P_{output,BL}}$$

Eq. 2b

Where:

Parameter	Description	Unit
$P_{output,\ BL}$	Output in baseline scenario in averaged over the 3 years prior to project development.	Tonne
$FC_{BSL,HFO}$	Fuel consumption of fuel *i* in baseline scenario averaged over the 3 years prior to project development.	Tonne
NCV_i	Net calorific value of fuel *i*	TJ/tonne
EF_i	Emission Factor fuel *i* (IPCC)	tCO_2/tonne

Baseline emissions are calculated in two steps. The carbon emissions per unit of output are calculated (tCO_2/tonne output), as in Eq. 2b. The result of this calculation is used to calculate total baseline emissions, as shown in Eq. 2a.

By multiplying the actual baseline emissions, which are calculated as the sum of the petroleum fuels multiplied by their respective emission factors, with a "production factor" that divides the project's output with the baseline's output, baseline emissions are calculated dynamically and account for changes in production. The amount of fuels *i* used to calculate the baseline emissions are based on the average fuel consumption by the factory for the years 2004-2006. For the *ex ante* calculations it is assumed that production during the project activity will equal Bromine Compounds' average production from 2004-2006. Actual production will be monitored, as described below. All data used in the calculation of the baseline are found in Annex 3.

Leakage:

No leakage calculation is required.

Emission Reduction:

$ER_y = BE_y – PE_y$

Eq. 3

B.6.2. Data and parameters that are available at validation:

(Copy this table for each data and parameter)

Data / Parameter:	$EF_{CO2,i}$
Data unit:	tCO_2/TJ NG
Description:	Emission Coefficient of natural gas considering both the net calorific value and oxidation factor.
Source of data used:	IPCC 2006
Value applied:	56.1
Justification of the choice of data or description of measurement methods and procedures actually applied :	As the methodology states: "IPCC default values for emission coefficients may be used."
Any comment:	IPCC default emission factor values will be determined at the start of the crediting period.

Data / Parameter:	$CF_{MMBTU \rightarrow TJ}$
Data unit:	TJ/MMBTU
Description:	Conversion factor to calculate the number of TJ per MMBTU
Source of data used:	http://www.onlineconversion.com
Value applied:	0.00105506
Justification of the choice of data or description of measurement methods and procedures actually applied :	Recognized conversion factor.
Any comment:	

Data / Parameter:	$FC_{HFO,j}$
Data unit:	Tonne
Description:	Fuel consumption of HFO in baseline scenario.
Source of data used:	Industrial Facility.
Value applied:	14,946
Justification of the choice of data or description of measurement methods	The data used to determine baseline emissions was taken from the factory's data management system. The amount of HFO used by the plant is a very important parameter for the plant and is thoroughly monitored for the purpose of lowering production costs. The source of data for fuel consumption is the fuel purchase

and procedures actually applied :	receipts received from the fuel supplier.
Any comment:	All data will be archived for the duration of the project activity plus two additional years.

Data / Parameter:	NCV_{HFO}
Data unit:	TJ/t HFO
Description:	Net calorific value for HFO.
Source of data used:	IPCC 2006
Value applied:	0.0404
Justification of the choice of data or description of measurement methods and procedures actually applied :	The methodology states: "IPCC default values for emission coefficients may be used."
Any comment:	IPCC default emission factor values will be determined at the start of the crediting period.

Data / Parameter:	EF_{HFO}
Data unit:	tCO_2/TJ HFO
Description:	Emission Factor for HFO.
Source of data used:	IPCC 2006
Value applied:	77.367
Justification of the choice of data or description of measurement methods and procedures actually applied :	The methodology states: "IPCC default values for emission coefficients may be used."
Any comment:	IPCC default emission factor values will be determined at the start of the crediting period.

Data / Parameter:	$P_{output,BL,y}$
Data unit:	Tonne
Description:	Tonnes of steam produced in the baseline scenario in year y.
Source of data used:	Industrial Facility
Value applied:	220,370
Justification of the choice of data or description of measurement methods and procedures actually applied:	For the calculation of baseline emissions, steam production data was taken from the factory's data management system. Steam was chosen for the output variable because it is the direct product of the boilers and is carefully monitored.
Any comment:	All data will be archived for the duration of the project activity plus two additional years.

B.6.3 Ex-ante calculation of emission reductions:

Project Emissions:

$PE_y = PE_{NG,y} + PE_{i,y}$

$PE_{NG,y} = \sum FC_{i,PJ,j} \times CF_{MMBTU \rightarrow TJ} * EF_i$

Project emissions were calculated with the following assumptions:

- Conversion factor from MMBTU to TJ is 0.00105506
- Fuel consumption (FC) in the project activity was estimated by taking the average amount of energy required in the baseline scenario (i.e. the amount of TJs used of each fuel) and calculating how many MMBTUs of natural gas would be required to generate this amount of energy.
- It is assumed that only NG will be used in the project activity. All fuel consumption will be monitored as specified below in section B.7.1

Year	FC_{NG} (TJ)	$CF_{MMBTU \rightarrow TJ}$ (TJ/MMBTU)	$COEF_{NG}$ (tCO_2e/TJ)	PE_y
2008	572,310.85	0.00105506	56.10	33,874
2009	572,310.85			33,874
2010	572,310.85			33,874
2011	572,310.85			33,874
2012	572,310.85			33,874
2013	572,310.85			33,874
2014	572,310.85			33,874
2015	572,310.85			33,874
2016	572,310.85			33,874
2017	572,310.85			33,874

Baseline Emissions:

$BEy = \Sigma BE_{per\ unit\ output,j} * P_{output,PJ,j}$

$$BE_{per\ unit\ output,j} = \frac{FC_{BL,i} * NCV_i * EF_i}{P_{output,BL}}$$

Baseline emissions were calculated with the following assumptions:

- Baseline fuel consumption was determined by averaging historical fuel consumption from 2004-2006 using the net calorific value (provided by the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*) to determine the amount of TJ contained by the fuel consumed.
- Baseline output was determined by averaging historical steam output from 2004-2006 from the factory.

Parameter	2004	2005	2006	Average
NCV_{HFO} (TJ/t)	0.0404			

EF_{HFO} (tCO_2/TJ)	77.37			
FC_{HFO} (t)	15,829	15,522	13,487	**14,946**
$P_{output,BL}$	227,144	227,152	206,813	**220,370**
$BE_{per\ unit\ output}$ (tCO_2/t steam)	0.21			

- For the purpose of the ex ante emission reduction calculation, it is assumed that future production will be the same as current production levels in the baseline:
- The emission factor used for HFO (EF_{HFO}), 77.37 tCO_2e/TJ was taken from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.
- A small amount of diesel was used for the backup boiler. However, to simplify the baseline calculation, only HFO has been included in the baseline calculation. This provides a conservative baseline because the portion of the baseline emissions generated by the diesel is not being counted. This lowers the level of baseline emissions, which means that emission reductions due to the project activity will be lower. Diesel use during the project will be carefully monitored and will be included in the project emission calculations.

Year	$P_{output,PJ}$ (t)	$BE_{per\ unit\ output}$ (tCO_2/t steam)	BE_y (tCO_2)
2008	220,370	0.212	46,716
2009	220,370		46,716
2010	220,370		46,716
2011	220,370		46,716
2012	220,370		46,716
2013	220,370		46,716
2014	220,370		46,716
2015	220,370		46,716
2016	220,370		46,716
2017	220,370		46,716

B.6.4 Summary of the ex-ante estimation of emission reductions:

Year	Estimation of project activity emissions (tCO2e)	Estimation of baseline emissions (tCO2e)	Estimation of Leakage (tCO2e)	Estimation of overall emission reductions (tCO2e)
2008	33,874	46,716	0	12,841
2009	33,874	46,716	0	12,841
2010	33,874	46,716	0	12,841
2011	33,874	46,716	0	12,841
2012	33,874	46,716	0	12,841
2013	33,874	46,716	0	12,841
2014	33,874	46,716	0	12,841
2015	33,874	46,716	0	12,841
2016	33,874	46,716	0	12,841
2017	33,874	46,716	0	12,841
Total emission reductions over the lifetime of the project (tCO2e)				**128,410**

B.7 Application of a monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

(Copy this table for each data and parameter)	
Data / Parameter:	$FC_{PJ,NG}$
Data unit:	MMBTU
Description:	Natural gas fuel consumption in the project

Source of data to be used:	Industrial facility
Value of data	572,310.85
Description of measurement methods and procedures to be applied:	The natural gas consumption of the boilers will be measured by a flow meter located in the Bromine Compounds plant.
QA/QC procedures to be applied:	The natural gas consumed by the boilers will be measured by one flow meter. This amount will be cross-checked against the measurements made by the individual flow meters located at each boiler.
Any comment:	All data will be archived for the duration of the project activity plus two additional years.

Data / Parameter:	$FC_{PJ,i}$
Data unit:	Tonne
Description:	Fuel consumption of all other fossil fuels in the project
Source of data to be used:	Industrial facility
Value of data	0
Description of measurement methods and procedures to be applied:	**HFO** The source of data for fuel consumption is the fuel purchase receipts received from the fuel supplier. **Diesel** Diesel use will be measured by fuel purchase receipts or by a measurement gauge on the fuel tank.
QA/QC procedures to be applied:	Each fuel delivery truck that arrives at the factory must provide a delivery certificate from the refinery, which contains the amount of fuel in the delivery as weighed by the refinery. Fuel purchase receipts are the most accurate way to measure fuel purchases because the refinery, which must deliver exactly what the client orders, weighs the fuel prior to delivery. The factory weighs the delivery truck at the entrance to ensure that the proper amount of fuel is delivered. The scale and measurement gauge are maintained according internal factory procedures.
Any comment:	All data will be archived for the duration of the project activity plus two additional years.

Data / Parameter:	$P_{output,PJ}$
Data unit:	tonnes
Description:	Tonnes of steam produced during the project
Source of data to be used:	Industrial facility
Value of data	220,370
Description of measurement methods and procedures to be applied:	Steam output is monitored by measurement gauges. In addition to the measurement gauges, steam output includes steam demand constants for regular steam requirements at the plant that do not change (set based on manufacturer's specifications for each system). The steam output data is sent from the measurement gauges directly to a file in the computerized data management

	system., which also includes the aforementioned constants. Once a month, the responsible manager enters the steam output data from the computerized data management system file into the computerized data management system.
QA/QC procedures to be applied:	Measurement gauges calibrated according to the manufacturer's specifications.
Any comment:	All data will be archived for the duration of the project activity plus two additional years.

B.7.2 Description of the monitoring plan:

Monitoring of parameters required to determine emission reductions (parameters listed above in section B.7.1) will be undertaken by the authorised individuals on-site. The project's monitoring plan will follow international standards and will include (but is not limited to) data monitoring, regular equipment maintenance and calibrations, data verification and troubleshooting measures.

The monitoring procedures for the project activity set the credibility by which the project's performance and GHG-reductions are measured. The monitoring procedures include developing data collection methods and means of data analysis to determine GHG reductions. Equally important are the operating procedures developed to ensure the proper operation of the project activity.

The monitoring demands in methodology III.B are:

"Monitoring shall involve:
(a) Monitoring of the fuel use and output for an appropriate period (e.g., a few years, but records of fuel use may be used) prior to the fuel switch being implemented - e.g. coal use and heat output by a district heating plant, liquid fuel oil use and electricity generated by a generating unit (records of fuel used and output can be used *in lieu* of actual monitoring);
(b) Monitoring fuel use and output after the fuel switch has been implemented - e.g. gas use and heat output by a district heating plant, gas use and electricity generated by a generating unit."

The methodology specifies the parameters needed to be monitored. These are fuel consumption and product output for both baseline and project scenarios.

Fuel Consumption: Natural Gas

1. The natural gas consumption of the boilers will be measured by a flow meter located in the Bromine Compounds factory.
2. The boilers' total natural gas consumption is measured by one flow meter, but each boiler will also have a flow meter to measure its individual gas consumption. The total gas consumption of all the boilers will be cross-checked with the data from the individual boiler flow meters.
3. Natural gas consumption data will be stored in the factory's computerized data management system.

Fuel Consumption: HFO

1. The HFO delivery truck arrives at the factory with a delivery certificate, which includes details of the delivery and the weight (amount) of fuel delivered. The amount of fuel delivered is entered into the computerized data management system.
2. The delivery truck is weighed at the gate and its weight is automatically entered into the computerized data management system. The truck is weighed again as it leaves the factory.
3. All data gathered for each fuel delivery is entered into the computerized data management system, which generates a report.

4. The responsible manager receives the fuel delivery report daily.
5. These reports are cross-checked with the fuel purchase receipts that the Bromine Compounds plant receives from the fuel supplier. Emission reduction calculations will be performed using the fuel purchase receipts.

Fuel Consumption: Diesel

Data on diesel use will be taken either from purchase receipts (like HFO) or from a measurement gauge located at the factory.

Steam Output

1. Steam output is monitored by measurement gauges. The steam output data is sent from the measurement gauges directly to a computerized data management system file. Once a month, the responsible manager enters the steam output data from the file into the computerized data management system.
2. There is a quantity of steam used internally by the factory that is a constant amount. These steam consumption constants are included in the data management system's file for steam output.
3. The data input to the computerized data management system is cross-checked with the steam output file.
4. For the purpose of the project, steam output data will be taken from the data management system.
5. The relevant measurement gauges will be calibrated according to the requirements set out by the plant's internal procedures.

B.8 Date of completion of the application of the baseline and monitoring methodology and the name of the responsible person(s)/entity(ies)

Baseline study completed by EcoTraders in October 2007. Contact information is available in Annex I.

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

March 1, 2008

C.1.2. Expected operational lifetime of the project activity:

20 years.

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

N/a

C.2.1.2. Length of the first crediting period:

N/a

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

June 1, 2008

C.2.2.2. Length:

10 years.

SECTION D. Environmental impacts

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D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

The Bromine Compounds factory was not required to conduct an environmental impacts analysis report for the fuel-switch project.[11] The project will, however, benefit environmental quality and the population's general health.

The project's elimination of HFO at the factory will improve air quality and reduce emissions of SO_x, NO_x and particulate matter. Furthermore, the HFO is delivered to the plant by truck, while the natural gas will be delivered via pipeline. The fuel switch will reduce the number of trucks travelling on the highways in Israel to deliver fuel to the factory, thereby reducing an additional source of air pollution and traffic congestion. The reduction in SO_x, NO_x and particulate matter will improve the air quality and therefore, the health and quality of life of the employees at Ramat Hovav and residents of the surrounding villages. The reduction in air pollution resulting from the heavy fuel oil and from the trucks that deliver the fuel to the factory will reduce the deposition of soot on the surrounding property.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

The project activity's environmental impacts are not considered significant. The Host Country does not require the completion of an EIA for internal retrofits at industrial facilities.

SECTION E. Stakeholders' comments

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E.1. Brief description how comments by local stakeholders have been invited and compiled:

A stakeholders' meeting was held on 3 September, 2007, in the town of Hura. Hura is a Bedouin town located about an hour's drive from the factory. The meeting was co-ordinated between the factory and a local NGO, Sustainable Negev and invitations were sent to NGOs, other factories in the area and local

[11] The *Regulations for Planning and Building (Environmental Impact Assessments), 2003* list the circumstances when an EIA is required. Internal factory changes to switch fuel inputs does not required an EIA. Available in Hebrew at http://www.sviva.gov.il/Enviroment/Static/Binaries/law/klali37_1.pdf.

residents. Representatives from Negev towns, Israeli NGOs and other stakeholders, such as employees of neighbouring factories, attended.

The meeting consisted of two presentations after each of which the meeting's participants asked questions about the project and offered comments. The first presentation was made by EcoTraders and provided stakeholders with information on the climate change, the Kyoto Protocol and the CDM process and a description of the project activity and its contribution to reducing greenhouse gas emissions. EcoTraders also provided an information sheet about the Kyoto Protocol and the project activity. Stakeholders were invited to send questions and comments to EcoTraders via a website specially developed for the project activity (the URL was given on the information sheet). The website remained open for 60 days.

A presentation was also given by the Bromine Compounds factory, which included more details about the project itself.

The following individuals attended the stakeholders' meeting:

Bilha Givon – Sustainable Negev
Muhammad Al-Nabari – Manager of the Sanitation Division, Hura
Fahima El Atuna– Resident, Hura
Talar El Atuna – Resident, Hura
Farkhan Abu Riash – Resident, Hura
Asher Goldstein – Machteshim (chemical company)
Yitzchak Barntziuk – Machteshim
Arie Cohen – Resident, Be'er Sheva
Yakov Wolfson – Sustainable Negev
Eli Levi - Resident, Omer
Renana Yassur
Riki Yisraelovitch - Resident, Be'er Sheva
Jan Wolfson – Bromine Community Forum
Avi Dlomi – Resident, Be'er Sheva
Fuad Diab – Rotem Amfert Negev
Shlomo Glidai – Rotem Amfert Negev
Atzmon Amitai – Bromine Compounds
Faisal El Atuna – Resident, Hura
Orit Nevo – Resident, Be'er Sheva

Please note that Be'er Sheva, Omer and Hura are towns located near the Ramat Hovav industrial zone.

Stakeholders' meeting for the Bromine Compounds Fuel Switch Project. September 3, 2007, Hura, Israel.

E.2. Summary of the comments received:

Q1: Is the trade in emission reductions between financial institutions or different countries?

Q2: If Germany has committed to reducing its greenhouse gas emissions by 5%, is it permitted to reduce further?

Q3: How certain is it that a project will receive revenues from the Clean Development Mechanism?

Q4: Is it possible for small factories to develop CDM projects?

Q5: Must the whole CDM process be completed before the project begins?

Q6: Does CDM include all GHGs?

Q7: Will the new demand for natural gas raise the price of natural gas and cause the price of HFO to fall?

Q8: What happens if the gas supplier stops supplying gas?

Q9: What is the role of IEC?

Q10: By which standard will the NG project at the Bromine Compounds plant operate? Doesn't natural gas pose safety risks?

Q11: What are the safety and environmental impacts of damage to a pipe?

Q12: How does the UN monitor and do quality control of projects like these?

C1: It seems to me that we are taking a risk in relying on Egypt for our energy needs.

C2: There have been a lot of articles in the press that natural gas isn't a dependable source of energy.

C3: Maybe the partnership with Egypt in natural gas will help the peace process.

C4: It is an historical event that these factories will operate on natural gas.

E.3. Report on how due account was taken of any comments received:

A1: Trade in emission reductions may take place between financial institutions or between different countries, depending on how a developed country with an emission reduction target has chosen to meet its target. A country can decide to require industry to account for 100% of the reductions, or the government can take upon itself a portion of the responsibility to meet the target.

A2: A country with an emission reduction target must meet its target. If installations, or the government, choose to undertake reductions beyond this target it is permitted.

A3: A project will be receive CDM revenue if it properly monitors its activities and follows the requirements of the CDM.

A4: Small factories certainly can develop CDM projects. Even kibbutzim can develop CDM projects to reduce their emissions, such as from animal manure.

A5: No. The CDM process can be undertaken in parallel with the development of a project. However, each CDM project must show that if it were not for the financial assistance provided by the sale of emission reductions, which is the benefit of CDM, the project would not have occurred. This is called "additionality".

A6: The Kyoto Protocol includes a large number of GHGs, including methane, N_2O, SF_6 and others. Our project will only reduce CO_2 because that is the main GHG that results from fuel combustion.

A7: Energy prices are connected, but natural gas prices are set in contracts for the long term, while HFO, diesel and naphtha prices fluctuate because orders for these fuels are made on an as-need basis.

A8: Some sort of guarantee on the part of the supplier will be built into the contract. It is true that there is uncertainty about the fuel supply when using natural gas, which is one of the problems with natural gas. HFO, diesel and naphtha are more reliable fuels because one orders them as needed and they are delivered.

A9: The project needs an adviser for the planning process. The Bromine Compounds plant has hired the IEC to act as its planner. IEC is the largest engineering company in Israel and has a lot of experience.

A10: There are two global standards for natural gas operations, the British and the Dutch. The project will operate according to the Dutch standard. Additionality, the Natural Gas Authority will oversee natural gas use Israel and provide permits for the project. The Natural Gas Authority's tests are very stringent.

A11: There are no safety or environment problems expected because the gas dissipates in the air. However, if there is a spark in the area where the pipe is damaged, the gas will combust which could cause environmental and safety problems. The pipe will be located 80-100 cm below the ground to prevent damage to it. Furthermore, control centers are located every few kilometers along the length of the pipe, and as soon as a control centre recognizes a fall in pressure in the pipe, due to a leak or other problem, the control center shuts down the gas flow.

A12: Each CDM project is audited prior to registration with the UN to ensure that the project meets all the CDM requirements. For project emission reductions to be approved by the UN, all monitored data and project procedures are audited. Only after a successful auditing will the project receive emission reductions. The UN authorizes certain third-party companies to carry out these project audits.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding from an Annex I Party provided for this project.

Annex 3

BASELINE INFORMATION

	2004	**2005**	**2006**	***Annual Average***	***Monthly Average***	**Source:**
storic Heavy Fuel Oil ·mand (HFO) (T/year)	15,829	15,522	13,487	**14,946**	**1,246**	*Purchase receipts*
storic Heavy Fuel Oil ·mand (HFO) (TJ/year)	640	627	545	**603.82**	**50.32**	*Calculated using IPCC data*
l Steam Production onne/yr)	227,144	227,152	206,813	**220,370**	**18,364**	*Factory measurements. Stored in factory computer system*

Fuel Type	**tC/TJ**	**Oxid. fact (%)**	**tCO2e/TJ**	**TJ/t fuel**	**tCO2e/t**	**Source**
Residual (heavy) fuel oil (HFO)	21.1	1	77.367	0.0404	3.12561	IPCC 2006
Natural gas	15.3	1	56.100	0.048	2.69280	IPCC 2006
	IPCC 2006 Vol. 2, Ch.1 1.23-1.24		Calculated according to formula given in Vol.2, Ch.1 p.1.23-1.24	IPCC 2006. Vol.2, Ch.1, pg.1.18-1.19. Values given as TJ/Gg. I calculated according to TJ/t (1Gg=1000tonnes)	Calculated using the data given in the IPCC 2006 Report for tCO_2/TJ and TJ/t fuel.	

Annex 4

MONITORING INFORMATION

Procedure Name	Objective	Scope
Staff Training	Staff training includes steps to ensure that staff receives proper training for factory operations and procedures related to the CDM project.	• Factory operations • Safety procedures
Data quality control and troubleshooting	To cross-check data and records prior to storage to ensure accuracy of data.	• Fuel use data • Production data
Equipment calibration	The intervals and steps by which equipment is calibrated.	• Scales

The CDM is currently under development and CDM O&M procedures will be developed as part of this process.