

# State of the Sea

# 2008 Report

## Economic Review

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Richard & Rhoda Goldman Fund  
Beracha Foundation

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**August 2008**



printed on recycled paper

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## Foreword

As in every year, Zalul is honored to present to the public its annual State of the Sea Report for Israel. This year the report addresses the economic aspects of marine pollution.

The purpose of this report, as has been the case since its inception, is to present the reader with a brief, precise, and independent overview of the pollution along Israel's Mediterranean coastline. Israel's Mediterranean Sea is a national treasure of the highest degree and its beaches serve as centers of recreation, livelihoods, and quality of life for its citizens and tourists.

The importance of protecting the environment in general, and prevention of marine and river pollution in particular, goes without saying. Pollution of the sea and of streams and rivers directly harms those who come in contact with it: bathers, vacationers, aquatic sport enthusiasts, and others. Moreover, such pollution damages the water resources of the state of Israel and lowers the quality of life of the public in general who must suffer the consequences of a polluted sea.

Data gathered and analyzed by the staff of Zalul demonstrates that millions of shekels should have been collected from industrial factories in Israel by means of a "discharge fee" based on the amount and type of effluent discharged. The report's findings indicate that discharge fees based on reasonable costs of treatment would represent only a small portion of the profits of most companies. The report also finds that Israel lacks organized and professional methods for evaluating the requirement that factories apply the Best Available Technologies (BAT), as required by law, despite adoption of BAT as a precondition for receiving discharge permits. The current policy provides incentives for mismanagement of marine and coastal resources, the results of which go beyond damage to public health and to the country's ecosystems. The current system, under which companies are not required to pay for their pollution, represents a subsidy provided by the public and the environment to private companies.

The initial reference point for this study is the fact that in Israel industrial effluents are discharged into the Mediterranean Sea by permit. These permits are issued by an "Inter-ministerial Committee for the Issuance of Discharge Permits", at the head of which sits the

Deputy Director General of the Ministry of Environmental Protection, and the Ministry's Marine and Coastal Environment Division, which gives professional assessment. With the approval of this Committee, each year over 50 million cubic meters of effluents are discharged along the coasts of Israel by means of pipes and via streams. In some cases, the discharge pipes are located close to public bathing spots or near ecologically sensitive areas.

By permitting the discharge of waste, the State of Israel created a situation in which public commons becomes a private commons serving as a waste receptacle for industrial factories. Take, as an example, the current situation in which discharge without a permit is punishable by imprisonment or fines, whereas discharge with a permit requires no payment based on the amount or quality of the effluent. This fact raises doubts regarding the commitment of the government of Israel to public resources and commons as compared to its commitment to industrial profits that come at the expense of the public and public health.

The 2008 State of the Sea Report evaluates this position from an economic perspective, by using data on permitted effluent discharges and accepted costs of sewage treatment. The main findings of the study demonstrate that by not implementing a discharge fee, the government is allowing millions of shekels to remain in the pockets of private industry, rather than go into the national treasury or towards development of advanced sewage treatment technologies. In essence, the primary objective of a discharge fee is to provide an economic incentive for the development of effluent treatment technologies and the reduction in consumption of freshwater.

An additional point raised by the study's findings relates to the ability of the Inter-ministerial committee responsible for issuing discharge permits to evaluate the compliance of those requesting permits with the legal requirement to implement the Best Available Technology for effluent treatment. The decision to issue a marine discharge permit is issued only once compliance with this requirement has been discussed. In practice, however, the committee often lacks the means necessary to evaluate whether a given company has indeed implemented such BATs. As such, it is necessary to determine in the committee's operating procedures clean methodologies, which will force permit requesters to pass evaluations done on a scientific and principled basis by objective certified external parties in order to receive permits.

In light of the findings of this report, one can only conclude that, to our dismay, in Israel private industry is given preference over public resources, at the expense of public rights and public health. A discharge fee, which currently is not collected from companies, is meant to be a payment or tax for the use of the sea as a waste depository. The intention is not to purchase the right to pollute the sea from the public, but rather, to place an economic burden on the polluting companies in order to provide incentive for the adoption of BATs or, in the very least, to provide compensation to the public for the damage inflicted. Proper planning to determine proper fee schedules demands a long term program for application of advance effluent treatment technologies, as the cost of the fee must be greater than the cost of BATs if it is to reduce both effluent discharge levels and freshwater consumption by industry.

Zalul sees this report as a means of contributing to Israel's progress towards the standards of the Western World and towards membership in the OECD, given the organization's strict environmental requirements regarding application of advanced sewage treatment technologies.

Yariv Abramovich  
Executive Director

# Executive Summary

## Background

Each year over 50 million cubic meters of industrial effluents and sewage are dumped into the coastal waters of Israel by special permit of the Inter-ministerial Committee for Issuance of Discharge Permits without any discharge fee. This amount does not include municipal sewage from treatment plants. Actual total effluent and sewage discharges are estimated at over 100 million cubic meters.

The Committee is committed by law to issue permits only when companies have applied the Best Available Technology (BAT) economically achievable for effluent treatment. Currently, the Committee lacks the appropriate tools to evaluate whether a permit applicant is actually complying with this BAT requirement.

This report evaluates discharge fees that should have been collected from those requesting permits. It finds that millions of shekels stay in the hands of corporations rather than going towards the application of best available technologies or a governmental fund for protecting the environment. Issuing permits without demanding any discharge fee results in marine pollution and lack of advanced treatment technologies.

The report provides a broad survey of the market failures associated with the current marine discharge policy in Israel; a policy in which corporate polluters benefit financially at the expense of the health of the public and the environment. It demonstrates that hundreds of millions of shekels that should be collected via a discharge fee are not. Such a fee would also serve as an incentive for improved sewage treatment. The amount of money that would be paid with such a fee would still represent only a small percentage of the profits of most of the polluting companies, this based on a survey of eight highly polluting permit holders. In addition, Section 1 of the Law of Prevention of Marine Pollution from Land Based Sources, which requires adoption of BATs, is not consistently and appropriately enforced.

## **Findings**

The economic analysis shows that currently there exists a market failure which hurts both the national treasury on one hand and the public's health on the other. According to a calculation of industrial discharge volumes and a treatment fee of 4 to 16.75 shekels per cubic meter (based on existing land based sewage treatment fees for effluent of various quality), the amount of money which is not collected and stays in the hands of the factories, is over 200 million shekels, and may be as high as 900 million shekels.

From evaluations of official corporate earnings reports it is clear that such discharge fees would represent only a small portion of the annual profits of most companies. The report finds that the discharge fee would represent between 1.3% and 5.4% of the annual profits and less than one percent of annual revenues of the 8 companies evaluated. These results indicate that many companies clearly have an ability to implement advanced effluent treatment, but because of market failures, have no incentive to do so.

## **Summary and Conclusions**

The report's findings and the implications that arise from them paint a worrying picture in which a market failure is negatively affecting both public health and the environment. Effluent fees, which could serve as a positive economic incentive to invest in reduction of and advanced treatment of industrial effluents, are not collected. In addition, the inability on the part of the Committee for issuing discharge permits to adequately evaluate whether companies have implemented BAT, further limits the possibility of reducing marine pollution.

1. Implementation of a discharge fee would result in a reduction of marine pollution by providing an incentive for reducing effluent volumes and improving effluent treatment
2. The cost to most major industrial factories, if there was a reasonable effluent discharge fee, would represent only a small percentage of their annual profits.
3. Similarly, implementation of a discharge fee would result in a reduction in the amount of freshwater consumed by industry by providing an incentive for adopting advanced technologies

4. Adopting BAT as a condition for discharge permits, as required by Article 1 of the Law for Prevention of Marine Pollution from Land Based Sources, is feasible.
5. The State Treasury can increase its annual revenues by an amount ranging from 200 million shekels – roughly equal to that of the annual budget of the Ministry of Environmental Protection – to up to 900 million shekels.

The recommendations of this State of the Sea Report for 2008 are as follows:

1. Implementation of a discharge fee as is instructed by Article 9A of the Law for Pollution Prevention from Land-Based Resources in order to create negative incentives for polluting factories.
2. Use of the money from the discharge fee to create a fund to protect and improve the coastal environment such as the Fund to Combat Coastal Oil Pollution.
3. The Permit Committee must demand from those requesting a permit to discharge into the sea to invest a reasonable percentage of their yearly earnings in Best Available Technology (BAT) requirement as part of the condition for permit issuance.

## **Section 1. The Role of Economics in Sea Pollution**

### **1.1 Introduction**

Israel coasts and coastal waters suffer from millions of tons of pollution each year, Land-based sources of pollution are numerous and varied, and include discharges from industry, municipal sewage treatment, and various commercial interests. Some of this pollution is accidental, but a large share is authorized by government permit. As no party is in favor of pollution, the possible explanations for high pollution levels all have a serious economic component to them, whether they be a desire to increase private sector profits, lack of funds for municipal sewage treatment, or simply lack of available information to the public with which investors and consumers would be able to make educated choices about how to use their money. Such conclusions are supported by statements coming from the private sector, policy makers at all levels of government, and the community of non-governmental organizations (NGOs).

Current policy provides incentives for mismanagement of marine and coastal resources which result not only in damage to public health and the nation's natural ecosystems, but also in serious market failures that represent potentially hundreds of millions of shekels of lost revenues and consumer benefits. The current practice of not charging companies to dump waste in the sea is essentially a subsidy according to which the public and the ecosystem provide a waste disposal service for free to private companies. The result is excessive amounts of pollution in our seas and along our coasts. Correcting such errant policy by charging companies according to the amount and type of pollution they discharge into the environment would provide a two-fold benefit by providing the companies with an incentive to increase investment in pollution prevention and provide the government with much needed revenues, which could add to general revenues or could targeted to investments further pollution prevention.

Because of the importance of understanding the role of economic incentives in addressing pollution along Israel's coasts, this section of the Zalul's 2008 State of the Sea Report will concentrate on highlighting some of the existing market failures. It will demonstrate that both the state of the sea and the state of the economy would be well served by altering policy to value environmental services and by charging for use of these services accordingly.

## **1.2. Current Policy as a Market Failure**

Market failures are situations in which typical market processes lead to an inefficient outcome, i.e., one that fails to maximize net economic benefits to society as a whole. Current pollution stems from policies which actually encourage several forms of common market failures: a) large-scale externalities, b) lack of proper investment in public goods, c) and lack of adequate information on the part of investors and consumers to make efficient investment and purchasing decisions. These result from free or nearly free distribution of permits to pollute, relatively small financial punishments for transgressing the laws, and limited monitoring and enforcement of current laws due to limited budgets. Given such policies, polluters have little incentive to reduce or eliminate their pollution.

### ***1.2.1. Externalities***

Externalities are situations in which producers of goods (e.g., factories, sewage treatment plants, retail businesses) are not forced to account for all of the costs of their activities. Pollution is perhaps the most common example of an externality, as generally the public as a whole ends up paying the price of pollution rather than those that created it. If, as is the case in Israel, producers are not forced to pay for the damages they cause (to “internalize the externality”), the outcome is generally inefficient. In the case of marine and coastal pollution in Israel a partial list of major external costs is included in Table 1 below. While no comprehensive research has yet been done to quantify the economic value of such externalities, research shows that each one of these externalities represents potentially tens of millions of shekels in lost revenues, investment opportunities and/or consumer benefits (Ofiara and Seneca 2001; Turner, Bateman et al. 2001). Research from 2001-2002 showed that economic losses from poor water quality and coral reef degradation in Eilat from scuba diving alone were worth over \$13 million shekels *per year* (Wielgus, Chadwick-Furman et al. 2003). Moreover, as this represents losses only from scuba-diving, who make up a relatively small portion of the visitors along Eilat’s beaches, the actual costs of poor water quality are likely orders of magnitude higher. At the time this study was undertaken, intensive aquaculture was allowed to degrade the waters at no charge, leaving the economic burden of the degradation wholly on the public and the ecosystems themselves.

Cheap or free distribution of pollution permits, weak enforcement, and relatively small fines ensures that it is cheaper for both large and small scale actors to pollute the nation’s seas, coasts and rivers than too invest in pollution prevention. For public corporations a legal responsibility to maximize dividend value for investors, provides an incentive not to go beyond the minimum required by law. Therefore, under current law which grants free permits for discharge of pollutants, it should not be surprising that pollution levels by large corporations remain high.

**Table 1. Major External Economic Costs Associated with Marine and Coastal Pollution**

- Loss of recreation opportunities and spending due to beach closures and loss of public confidence in water quality
- Public health risks (including lost wages and consumer benefits from illness)
- Lower property values around polluted areas
- Lower investment in economies along the coast
- Reduced fisheries catches
- Damage to groundwater quality from seepage of polluted waters
- Damage to surface water and drinking supplies from pollution to Lake Kinneret
- Damage to marine and coastal ecosystems

### ***1.2.2. The Sea, Coasts, and Streams as Public Goods***

Another factor leading to market failure is the fact that the sea, coasts, and streams in Israel are public goods and/or common pool resources. This means that users can enjoy the benefits of a good that belongs to society as a whole, without paying the full price of degradation. While the benefits from pollution and other uses of coastal resources are captured exclusively by the polluter or developer, the costs are shared by the public as a whole. For instance, avoiding installing advanced pollution prevention technology results in costs savings exclusively for a business or municipality. These same actors may also suffer some of the consequences of the pollution, but because these costs are shared by numerous others, the business has an incentive to pollute. For instance, the press reported numerous examples from the last year alone of municipalities, factories, restaurants, hotels, and others polluting the very beaches and waters in which they operate. This has a negative impact on the polluters themselves, but because the costs are shared by other users, the costs to the polluters are outweighed by the money saved through continued pollution. Underinvestment in public goods, including environmental enforcement and infrastructure, is a classic market failure, and it is widely agreed that government intervention and regulation is necessary to avoid such failures.

### ***1.2.3. Lack of Sufficient Information for Efficient Investor and Consumer Decision-making***

One of the advantages of free markets is that, when functioning effectively, consumer and investor decisions send signals to producers about what goods and production processes are desired. In order for these actions to be effective and to lead to efficient outcomes, however, consumers, investors, and the public affected by the production of the goods need information regarding the production processes and potential liabilities. Without such information, they cannot make informed choices that would send the proper market signals to the producers.

In the case of Israel, information regarding the type and quantity of pollution discharged is not made available to the public. Ostensibly done to protect business secrets, the result of this failure to inform the public is excessive exposure to pollution such as heavy metals, volatile organic compounds, and fertilizer and pesticide runoff. In other countries, companies are required by law to report their releases of potentially toxic materials (e.g., the U.S. Toxic Release Inventory). Research has shown that high levels of toxic emissions by companies can significantly lower the

value of the companies' stock, as investors see it as a sign of waste and mismanagement and a potential future legal liability (Hamilton 1995; Konar and Cohen 1997; Konar and Cohen 2001). In addition to investors, consumers of products have demonstrated a willingness to pay for products produced in less environmentally damaging ways, e.g., the organic food market, the growth of which has outpaced that of industrial produced goods over the past decade (OTA, 2008). Lack of publicly available information prevents consumers from sending market signals that reflect their true wants. This is true not only in the case of consumers of products produced by the polluting factories, but in terms of any good whose price might be affected by the pollution, e.g., housing markets.

### **1.3. Failure to Incorporate Economic Measures to Correct Market Failures**

In cases of market failures such as those just mentioned, government intervention is required in order to achieve an efficient outcome. The current policy framework is woefully inadequate in this respect. The following are examples of how the current policy fails to incorporate economic efficiency rationale.

#### ***1.3.1. Technology Requirements***

The Marine Pollution Prevention From Land-Based Sources Regulation (1990) requires factories applying for a Marine Discharge Permit to install the Best Available Technology (BAT) that is economically feasible. Because the term “economically feasible” is subjective, and no industrial sector-specific technologies are specified, the regulation is (are?) subject to much manipulation by companies who can claim that the existing technology is too expensive to be feasible in their case. Because of insufficient knowledge as to cost structures on the part of government regulators, it is difficult for them to challenge such claims. Still, based on technologies used by similar companies abroad, it appears that many factories in Israel are not applying the BAT economically achievable or are capable for further improvement is wastewater treatment.<sup>1</sup> Technology requirements may be helpful in reducing pollution, but they do not assure an efficient outcome, nor do they internalize the costs of the pollution that is discharged.

#### ***1.3.2. Pollution Fees, Taxes, and Fines***

Forcing the polluters to pay for the damages they inflict on society by polluting is perhaps the most obvious and direct way to address market failures from externalities. Doing so sends correct market signals to the polluters. Provided the fees are sufficiently high, they will lead to a reduction of pollution. At a minimum, discharge fees serve as a way of raising government revenues which can be used to compensate for damages from pollution, upgrade sewage treatment facilities, or augment general funds.<sup>2</sup> Given that the Ministry of Environment's budget is less than a hundredth of one percent of the total government budget<sup>3</sup> and that many municipalities and regional authorities are strapped for money, the current lack of discharge fees represents a serious missed opportunity to raise needed funds while at the same time reducing

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<sup>1</sup> Pollutant Levels of Major Dischargers to the Kishon Compared to Discharge Levels of US and EU BAT, P. W. Foley, D. B. McGuigan, August 2007, Prepared for Zalul

<sup>2</sup> Israel recently implemented a fee for waste disposal with the same rationale. The funds raised by the disposal fee go to a fund for facilitating waste treatment technology adoption and recycling.

<sup>3</sup> According to Ministry of Environment website: <http://www.sviva.gov.il/>

pollution. Moreover, if applied correctly, revenues raised by emission taxes or fees can replace other taxes, such as income and sales taxes which impede economic growth. Thus, the environmental levies can produce a double dividend: reducing both pollution and existing distortionary taxes (Goulder 1995; Hanson and Sandalow 2006).

The current system, in which polluters are granted permits by the government to dump at sea is, in essence, a subsidy paid for by the public. Polluters use the sea for waste disposal and pay almost nothing for this service, allowing them to save millions of dollars, while citizens face risk of disease and ecosystems are degraded. Presently, polluters must apply for a permit to dump. The application fee for this permit is nominal: ranging from a few thousand to roughly 30,000 shekels, depending on the type of pollution to be discharged. This fee covers little more than the administrative costs of processing the application, and the small amount does not serve as any kind of economic incentive to reduce pollution. Rather, it is just a small administrative cost that is easily absorbed by applicants. It is not correlated to the amount or type of pollutant to be discharged, and thus, the current system provides no incentive to reduce the amount of waste produced. This policy regarding dumping in the sea is in contrast to existing policies for land based sewage treatment and solid waste disposal, in which polluters are charged for their waste. It is also a violation of the Amendment to the Law on Land-based Sources of Pollution of 2005, which directs the government to implement a discharge fee that would serve as an economic incentive to reduce pollution and would compensate society for the environmental damage incurred. According to the Ministry of Environment, such a policy was supposed to have been implemented by the end of 2007.<sup>4</sup>

Economically efficiency, not to mention basic equity considerations, would be served by charging the polluters a per unit pollution fee. To be economically efficient the level of the fee should cover the marginal damages plus the costs of monitoring and enforcement. The more one pollutes, the more one is charged. Currently, data regarding the marginal economic costs of damages in Israel does not yet exist. However, other targets for setting fees can be: a) to raise enough funds to be able to compensate those who suffer from the damages, b) cover the cost of environmental mitigation or restoration, c) to raise funds sufficient for financing the upgrading of sewage treatment to recommended standards.<sup>5</sup> Any one of these policies is likely to both improve economic efficiency and reduce pollution by providing incentives for pollution reduction and/or by generating government revenues that could facilitate pollution reduction and treatment. In order not to devastate small-scale businesses, fees can be structured in a tiered fashion, such that the fee for initial small levels of pollution are relatively low, but increase with increased levels of pollution.

Companies also need to be charged when they fail to abide by the permit levels granted. In cases in which firms or other polluters pollute beyond the levels allowed by law, fines need to be sufficiently high that they serve as a real disincentive to pollute. In order to make fines a credible disincentive to pollute, discharges need to be properly monitored. This monitoring can

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<sup>4</sup>[http://www.sviva.gov.il/Enviroment/bin/en.jsp?enPage=BlankPage&enDisplay=view&enDispWhat=Object&enDispWho=Articals^15137&enZone=heterim\\_hazrama\\_yam](http://www.sviva.gov.il/Enviroment/bin/en.jsp?enPage=BlankPage&enDisplay=view&enDispWhat=Object&enDispWho=Articals^15137&enZone=heterim_hazrama_yam)

<sup>5</sup> The cost of upgrading facilities to the standards recommended by the Inbar Commission is estimated at over a billion shekels (source: [http://www.sviva.gov.il/Enviroment/Static/Binaries/Articals/miki1\\_1.ppt](http://www.sviva.gov.il/Enviroment/Static/Binaries/Articals/miki1_1.ppt)).

be funded by the permit applications and/or discharge fees. The State Comptroller's Report of 2008 revealed serious limitations in the government's ability to enforce and collect fines for transgressions of environmental regulations. Polluters know that the chance of actually being caught and fined is low, and so the expected value of even a relatively large fine is also low. If the expected value (actual level times the chance that they will be enforced) of fines are low, polluters will simply treat them as part of their normal operating expenses and they will not serve to reduce pollution.

### ***1.3.3. Subsidies for Pollution Prevention***

In theory subsidies or payments for pollution reduction can achieve the same results as emissions fees and pollution taxes. Subsidies, however, do not send the appropriate long-term market signals to polluters. Moreover, in order to provide a subsidy, government revenues have to be raised through taxes on other goods or services. Therefore, subsidies should be used sparingly and judiciously, such as in cases in which social equity is of concern (e.g., the funding of sewage treatment facilities in poorer municipalities) or in order to develop fledgling pollution prevention technologies. Subsidies are inefficient if they are going towards private producers who produce large external costs via pollution, as is the case under current policies.

### ***1.3.4. Pollution Markets***

Another way in which to address market failures from marine pollution is to implement a pollution market. Under such a system, the government determines a "cap" or a maximum amount of allowable pollution. Polluters must hold permits for their discharges. If properly enforced, such a system has the advantage of ensuring safe levels of discharges, while allowing companies and other polluters to decide for themselves how to most cheaply reduce pollution. Cap and trade pollution permits also serve as a means of revealing actual pollution control costs, which companies often exaggerate in order to avoid stringent regulation.

Several pollution permit trading programs already exist in other countries, including for water and coastal pollution (ETN, 2008). Permits can be auctioned off or sold by the government, thereby raising revenue and implementing the Polluter Pays Principle. The current system in which the fee for pollution permits is negligible and is not pegged to the amount of pollution in essence represents a subsidy granted by the government to the polluters: a Pay the Polluter policy rather than a Polluter Pays one.

In order to determine the appropriate cap, the government needs to determine the maximum allowable pollution level for each coastal location. Such a system is akin to the "total maximum daily loads" or TMDLs required for impaired water-bodies in the U.S. The maximum pollution level allowed can be lowered over time to phase out pollution. The TDML approach is not yet adopted by the Israeli regulator. One example is the Kishon River which has water quality standards (concentrations) however does not have permitted daily or monthly loads.

#### **1.4. Current Impediments to Policy Reform**

Given the clear economic, environmental, and public health benefits, it is not clear why policies as those recommended above have not yet been implemented. One possible reason is the mistaken belief that such policy reforms which enforce the Polluter Pays Principle will harm business competitiveness or even cause business to relocate out of Israel. There is little empirical evidence for either belief. Environmental protection costs generally represent a small portion of overall operating expenses for most companies. Other factors such as availability of human resources, wage rates, and proximity to markets tend to be the factors that determine where factories operate. Indeed, statistical studies show that nations with more stringent environmental regulation and enforcement are the more successful, productive, and competitive economies (Esty and Porter, 2001). In this regard, Israel's record on environmental regulation ranks markedly below other countries of similar levels of economic development (ibid, 2001). Moreover, research has shown that at the firm level companies with better social and environmental records tend to outperform their more polluting competitors in terms of stock value and profitability (Miles and Covin 2000; Orlitzky et al. 2003). Stricter environmental regulation often is also a catalyst spurring cost-saving innovations (Porter and van der Linde 1995). The most important factor for effective business planning is clear and consistent policies, not low standards and weak enforcement.

Another possible reason for not implementing the recommended reforms is a lack of funds for enforcement or for financing necessary improvements in the case of public sewage treatment facilities. This too is not a valid reason not to reform the current system. Discharge fees, higher fines, or cap and trade permit systems all would raise government revenues, which could then be used to help finance necessary reforms and upgrading of facilities in economically weak regions. Moreover, methods exist for minimizing costs to polluters such as deposits that are returned upon proof of proper waste treatment. An independent benefit-cost analysis of the upgrading of sewage treatment to meet the Inbar Commission standards, which would allow for reuse of treated sewage, showed that such an upgrade indeed provides net benefits to society (Pareto 2003, 2004). A major obstacle to proper treatment for many plants is not only the initial capital costs of upgrading facilities, but secure funding for recurring annual operating expenses. Emission fees and/or permit sales could provide such an annual source of funding.

#### **1.5. Conclusions**

Current policies allow for excessive levels of pollution which result in serious environmental, public health, and economic damages. The lack of discharge fees is both inefficient from an economic perspective and inequitable in that it allows private polluters to benefit economically by polluting while imposing the costs of their pollution on the public as a whole. Moreover, the nearly free distribution of pollution permits represents a missed opportunity to generate much needed government revenues. Pollution fees or tradable permits together with increased transparency in terms of pollution levels would contribute to economic efficiency, alleviating government budget deficits, and improving the quality of the nation's coasts and seas. The following section presents calculations of proposed discharge fees for several of the largest

polluters, and demonstrates the potential of such fees to both provide an incentive to reduce pollution and to raise government revenues.

## **Section 2. Marine Discharge Fees – A Proposed Application**

### **2.1. Fee Description**

The previous section described theoretical and practical economic rationales for reforming policies affecting the marine and coastal environments. This section provides a demonstration of a proposed application of one type of reform that is likely to increase economic efficiency and reduce pollution: the institution of a pollution discharge fee. Such pollution charges are implemented in several other spheres of the economy. Currently, households and small businesses pay a sewage discharge fee tied to the amount of their water consumption and municipalities and local authorities pay a dumping fee for solid waste sent to landfills. As mentioned above, Amendment to the Law on Land-based Sources of Pollution, which entered into force on 22 June, 2005, authorizes the government to implement a fee for marine and coastal discharges; however, three years later, this policy has yet to be implemented.

By linking the fee to the type and amount of pollution discharged, such a fee would provide polluters with an economic incentive to reduce and/or upgrade treatment of discharges and would provide the government with revenues. These revenues could either go to general funds, or could go towards the Marine Pollution Prevention Fund, currently overseen by the Ministry of the Environment. Possible uses of the revenues from such a dedicated fund could be to:

- a) Assist small companies or municipalities with sewage treatment costs,
- b) subsidize development of pollution treatment technology,
- c) compensate people or municipalities who suffer from marine pollution, or
- d) fund marine and coastal ecosystem restoration and/or damage mitigation.

The precedent for such a dedicated use of pollution fees already exists. Revenues from boating fees, from applications fees for discharge permits, and from fines on illegal marine dumping currently go towards the Marine Pollution Prevention Fund, and revenues from Israel's solid waste dumping fee go to a fund for encouraging waste reduction and recycling. From an economic efficiency perspective, the use of the revenues generated is not relevant – regardless of the intended use, the fee would provide the same incentive to reduce pollution. Dedicating the funds to marine pollution prevention activities, however, may prove more acceptable to policy-makers and the public at large, and would certainly be a desirable use of the monies from an environmental perspective.

### **2.2. Determining the Fee Level**

In theory the economically efficient fee would be set equal to the marginal damage caused by the discharge. This economic damage is a function not only of the type and amount of pollution, but the time, season, and location of discharge, as well as the population exposed. Devising a fee according to such criteria is exceedingly complex, and therefore is rarely if ever done in practice. Given the difficulties in determining the marginal damages, alternative methods for fee scheduling need to be adopted. One method is to look at current sewage treatment costs for land-based sewage. This is the method adopted in this section.

As discussed above, dischargers of pollution to the sea are essentially receiving a waste disposal service free of charge, paid for courtesy of the environment and public health. The average fee for municipal sewage treatment is 4 shekels (NIS) per cubic meter (m<sup>3</sup>) of sewage. Sewage containing high levels of pollutants are charged extra to cover the additional treatment costs necessary. For the purposes of this study, we analyze the projected costs of implementation of a marine discharge fee using as a lower-bound estimate for the fee, the 4 NIS/m<sup>3</sup> charge that the companies would pay if they sent sewage to a municipal treatment center. Much of the actual waste discharged by companies to the sea contains high levels of organic materials, heavy metals, and other inorganic materials, some of which are highly toxic. The upper-bound estimate of a discharge fee used in this study is 16.75 NIS. This fee level represents the median fee charged by the Ramat-Hovav Biological Treatment Facility "Tibam", a center that undertakes pre-treatment of highly polluted effluent – 12.75 NIS – plus the 4 NIS sewage treatment fee (source: Ramat-Hovav Industrial Council – Tibam fees, December 2007) that would be charged once the highly polluted effluent was treated to a sufficiently high level that it was eligible for discharge to a municipal treatment center. Given the high pollution rates of most of the marine discharges, this figure likely represents a more accurate estimate of an efficient discharge fee.

## **2.3. Comparison of Discharge Fee Costs and Corporate Revenues and Profits**

### ***2.3.1. Overview***

Israeli law requires that potential dischargers implement the Best Available Technology that is economically feasible. Therefore, a key condition for granting of a permit to discharge is the claim that treatment would be prohibitively expensive. This study will now present calculations of the economic burden faced by companies should they be forced to pay a discharge fee at the levels described above. The calculations are provided for eight of the largest private sector polluters. The cost to the company is calculated as the discharge fee multiplied by the amount of waste each company is permitted to release per year in its discharge permits. No attempt was made to account for the type or concentration of waste discharged. For comparison purposes, the company's 2007 annual revenues and net profits are also presented, as is the estimated costs of the discharge fee as a percentage of annual revenues and of annual profits. Company financial data was taken from annual financial reports.<sup>6</sup> The calculations are summarized in Table 2 below.

A discharge fee of 4 NIS per m<sup>3</sup>, would generate nearly 53 million NIS annually in government revenues from the eight companies examined if each discharged the maximum amount allowed under its permits. In practice the fee would only be applied to the volume of waste actually discharged, which is often less than that allowed under the permit. Thus, the actual costs to companies would be less than those estimated here. For none of the eight companies evaluated did the estimated costs represent more than 1% of 2008 annual revenues, and in most cases, much less than 1%. For five of the seven companies for which profit data was available, a 4 NIS

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<sup>6</sup>Because Haifa Chemicals is a wholly owned subsidiary of a privately owned corporation, Trans-Resources Inc., financial data are not made available to the public. Data on 2006 revenues for Haifa Chemicals were taken from Dun's 100, <http://duns100.dundb.co.il/>. In cases in which financial data were published in dollars, a conversion rate of 4.46685 NIS to 1 US\$ was used for 2006 data, and 4.1144 NIS to 1 US\$ for 2007 were used. These rates represent the average interbank exchange rates for each year.

per m<sup>3</sup> would represent between 0.1-3.3% of 2007 profits. The results for the other two companies, Gadot Biochemical and Delta Galil, can be explained in large part to corporate restructuring and acquisitions that affected 2007 profit levels. Gadot Biochemical reported 2007 profits of only 540,000 NIS, but in 2006, the companies declared profits were 31.8 million NIS. Likewise, Delta Galil reported losses of over 50 million shekels for 2007, but profits of over 13.8 million NIS in 2006. Using 2006 profit levels for these two companies, the 4 NIS per m<sup>3</sup> discharge fee would represent 13% and 6% of profits for Gadot Biochemical and Delta Galil respectively. These figures are significantly higher than for the other five companies, but still would leave the companies with most of their profits intact.

A discharge fee of 16.75 NIS per m<sup>3</sup>, would generate nearly 222 million NIS annually in government revenues. For all but two of the eight companies, even this higher cost would account for less than 1% of 2007 revenues. For the other two, the discharge costs would represent 2.3% (Haifa Chemicals) and 4.3% (Gadot Biochemical) of 2007 revenues. The higher pollution fee would also account for a proportionally higher share of profits. For five of the companies, the higher discharge fee costs would represent between 0.4% and 13.7% of 2007 net profits. For Gadot Biochemical and Delta Galil, the higher fee would represent 60.5% and 25.4% of 2006 profits respectively.

## **2.4. Company Profiles**

A brief description of each of the eight companies listed including their primary products, corporate structure, and the type and amount of pollution discharged by each is provided below. The companies listed below were selected on their discharge volumes and pollutant loads in their wastewater.

### **Haifa Chemicals**

Haifa Chemicals produces fertilizers, food additives, and other chemicals for industrial use, with operations in Israel and in over 80 other countries. It is the world's largest producer of potassium nitrate, a key ingredient in many fertilizers. Haifa Chemicals has production facilities in Haifa Bay, the Northern Negev, and France. The company was established in 1967, and is now owned by the privately held U.S.-based conglomerate Trans-Resources Inc. Because the company is privately held, data on revenues and profits are not made public. A figure of 2006 revenues of US\$ 402.5 million was obtained from secondary sources. Based on permits for discharges of 2.5 million m<sup>3</sup> of polluted effluents per year, Haifa Chemicals would pay 10 million NIS annually with a 4 NIS per m<sup>3</sup> discharge fee or 41.9 million NIS with a 16.75 NIS per m<sup>3</sup> discharge fee. These figures represent 0.56% and 2.33% of 2006 annual revenues respectively.

### **Oil Refineries Ltd. (BAZAN)**

Oil Refineries Ltd. (BAZAN) is Israel's largest oil refinery and, in 2007, it was the second largest industrial company in Israel in terms of annual revenues, trailing only behind Teva Pharmaceuticals. BAZAN was established in 1936. Its facilities, located in Haifa Bay, have a production capacity of 24,800 tons (180,000 barrels) of oil per day. Over three-fourths of the company's production is for the Israeli market, with the rest exported primarily to other Mediterranean countries. In addition to its own refining production, BAZAN also owns a 50% share in Carmel Olefins Ltd. (see below) and 100% of Gadiv Petrochemical Industries Ltd. It also has significant holdings in several other chemical and petroleum related companies. The company's 2007 profits of 693 million NIS were 3.25% of total revenues. Based on permits for discharges of 5.67 million m<sup>3</sup> of polluted effluents per year, BAZAN would pay 22.7 million NIS annually with a 4 NIS per m<sup>3</sup> discharge fee or 95 million NIS with a 16.75 NIS per m<sup>3</sup> discharge fee. These figures represent 3.27% and 13.7% of 2007 annual profits respectively.

### **Carmel Olefins Ltd.**

Carmel Olefins produces raw materials to plastics industry in Israel and abroad. It manufactures a range of monomers and polymers, including polyethylene and polypropylene. Carmel Olefins was established in 1991 from assets held by BAZAN and Israel Petrochemical Enterprises Ltd. It is now owned jointly by these two companies, with each holding a 50% share in the company. In 2007 Carmel Olefins completed upgrading and expansion of facilities which have allowed it to significantly increase production. Current polypropylene production capacity is estimated at 450,000 metric tons annually. 2007 profits of 133 million NIS were 4.75% of annual revenues. Based on permits for discharges of 857 thousand m<sup>3</sup> of polluted effluents per year, Carmel Olefins would pay 3.4 million NIS annually with a 4 NIS per m<sup>3</sup> discharge fee or 14.4 million NIS with a 16.75 NIS per m<sup>3</sup> discharge fee. These figures represent 2.6% and 10.8% of 2007 annual profits respectively.

### **Gadot Biochemical Industries Ltd.**

Gadot is a large producer of chemicals for use in the food & beverage, mineral supplement, cosmetic, detergent, and pharmaceutical industries. Products include fructose, citric acid, citrate salts, phosphate salts and mineral fortifiers. Gadot was established in 1962. It sells both to the domestic and international markets. 2007 profits of 133 million NIS were 4.75% of total revenues. 2007 profits of 540 thousand NIS were just 0.12% of annual revenues. This figure is not representative of Gadot's typical profit margins, however. Rather it is a result of corporate restructuring and investments in 2007. 2006 profits of 31.8 million NIS were 8.7% of annual revenues. Based on permits for discharges of 1.15 million m<sup>3</sup> of polluted effluents per year, Gadot would pay 4.6 million NIS annually with a 4 NIS per m<sup>3</sup> discharge fee or 19.3 million NIS with a 16.75 NIS per m<sup>3</sup> discharge fee. These figures represent 14.5% and 60.5% of 2006 annual profits respectively.

### **Israel Chemicals Ltd. (ICL) - Fertilizers**

Israel Chemicals Ltd. (ICL) produces fertilizers and chemicals for industrial use, including as food additives, flame retardants, detergents, and others. Established in 1968, ICL has become the world's largest producer of bromine (~one third of global production), pure phosphoric acid, and specialty phosphates, and is among the world's leading suppliers of potash, magnesium, and PK fertilizers. ICL has mining concessions in the Dead Sea and Negev regions. ICL operates three related companies: ICL Fertilizers, ICL Industrial Products, and ICL Performance Products. As of 2007 ICL was the fourth largest industrial company in Israel in terms of annual revenues, after Teva, BAZAN, and the Israel Electric Corporation. Revenue and profit figures provided in this report represent aggregated revenues and profits for ICL as a whole, as detailed information regarding the profitability of each of the subsidiaries was not available. From available data, ICL Fertilizers accounted for 45% of ICL's total revenues in 2006, making it the largest of the three subsidiaries. ICL's 2007 profits of 536 million NIS were 13.1% of total revenues. Based on permits for discharges of 525 thousand m<sup>3</sup> of polluted effluents per year, ICL would pay 2.1 million NIS annually with a 4 NIS per m<sup>3</sup> discharge fee or 8.8 million NIS with a 16.75 NIS per m<sup>3</sup> discharge fee. These figures represent 0.1% and 0.4% of annual profits respectively.

### **Oil Refineries Ashdod**

Oil Refineries Ashdod (ORA) began operation in 1973, as part of BAZAN. After over 30 years of operation, the government forced a split between the Haifa and Ashdod oil refineries, in a privatization effort design to increase competitiveness and prevent monopoly market power. In 2006, ORA was purchased by Paz Oil Company Ltd., Israel's largest vertical energy corporation. ORA has a refining capacity of 90,000 barrels a day. The figures for revenues and profits for ORA represent only the refining subsidiary of Paz, as reported in the company's 2007 annual report. ORA's 2007 profits of 372 million NIS were 4% of total revenues. Based on permits for discharges of 1.575 million m<sup>3</sup> of polluted effluents per year, ORA would pay 6.3 million NIS annually with a 4 NIS per m<sup>3</sup> discharge fee or 26.4 million NIS with a 16.75 NIS per m<sup>3</sup> discharge fee. These figures represent 1.7% and 7.1% of annual profits respectively.

### **Makhteshim-Agan Industries Ltd.**

Makhteshim-Agan is the world's leading manufacturer of generic crop protection products. As of 2007, it was Israel's seventh largest industrial company based on revenues, and the seventh largest company in the world in the crop protection sector, with over 5% of global market share. Makhteshim-Agan is the result of a 1997 merger of Makhteshim and Agan companies. The company owns manufacturing facilities in Israel, Europe, and South America. Makhteshim-Agan's 2007 profits of 733 million NIS were 8.6% of total revenues. Based on permits for discharges of 750 thousand m<sup>3</sup> of polluted effluents per year, Makhteshim Agan would pay 3 million NIS annually with a 4 NIS per m<sup>3</sup> discharge fee or 12.6 million NIS with a 16.75 NIS per m<sup>3</sup> discharge fee. These figures represent 0.4% and 1.7% of annual profits respectively.

### **Delta Galil**

Delta Galil is one of the world's largest producers of undergarments and related apparel. As of 2007 it was Israel's largest manufacturer in the textile and clothing sector, based on revenues. Founded in 1975 in Israel, Delta Galil now has manufacturing facilities around the world. Roughly 10% of its sales are in the Israeli market, with the rest coming from abroad. Delta Galil reported losses of US\$ 12.5 million in 2007. Again, this figure is not representative of Delta Galil's typical profit margins. It is a result of corporate restructuring and investments in 2007 as well as a decline in the U.S. and European markets. 2006 profits of 18.8 million NIS were 0.4% of annual revenues. Based on permits for discharges of 210 thousand m<sup>3</sup> of polluted effluents per year, Delta would pay 840 thousand NIS annually with a 4 NIS per m<sup>3</sup> discharge fee or 3.5 million NIS with a 16.75 NIS per m<sup>3</sup> discharge fee. These figures represent 6.1% and 25.4% of 2006 annual profits respectively.

### **2.5. Summary**

The application of a fee for effluents released to sea makes sense from both a perspective of economic efficiency and one of environmental protection. It will serve both as an economic incentive for polluters to reduce pollution and could serve as a secure source of government revenues, perhaps funding the Marine Pollution Prevention Fund. This survey shows that, at least for many of the largest polluters, the application of a fee based on current land-based sewage treatment costs would amount to a small share of annual corporate profits.<sup>7</sup> While a discharge fee is not the only policy option that could achieve such goals (e.g., auctioning of pollution permits could also achieve similar objectives), the application of a discharge fee is already mandated by law. Sadly, however, it has yet to be applied. The result is a missed opportunity to improve both the nation's economy and its coastal and marine environment.

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<sup>7</sup> It must be noted that many of the companies listed above are international companies, and the profits figures listed in this report, are taken from company annual financial reports. Thus, in most cases they reflect profits for the company as a whole, and do not reflect profits only from Israeli production.

Profits-Fee ratio		Income-Fee ratio		Profits	Incomes	Fee-High rate	Fee-low rate	Capacity	Corp. name
High %	Low %	High %	Low %	X1000 NIS	X1000 NIS	X1000 NIS (16.75 NIS/m3)	X1000 NIS (4 NIS/m3)	m <sup>3</sup> / year	
		2.33%	0.56%		1,797,907 <sup>1</sup>	41,875	10,000	2,500,000	Haifa Chem.
13.70%	3.27%	0.45%	0.11%	693,000	21,339,364	94,973	22,680	5,670,000	Haifa Ref.
10.80%	2.58%	0.51%	0.12%	132,871	2,800,284	14,355	3,428	857,000	Carmel Olefines
3567.13%	851.85%	4.27%	1.02%	540	450,828	19,263	4,600	1,150,000	Gadot Bio-Chem.
0.40%	0.10%	0.05%	0.01%	2,203,837	16,870,208	8,794	2,100	525,000	ICL – Israel Chem. (Deshanim) <sup>2</sup>
7.09%	1.69%	0.28%	0.07%	372,073	9,285,030	26,381	6,300	1,575,000	Ashdod Ref.
1.71%	0.41%	0.15%	0.04%	733,310	8,563,079	12,563	3,000	750,000	Agan-Chem Ashdod
(6.82%)	(1.63%)	(0.13%)	0.03%	(51,574) <sup>4</sup>	2,663,700	3,518	840	210,000	Delta Textile
<b>5.43%</b>	<b>1.30%</b>	<b>0.35%</b>	<b>0.08%</b>	<b>4,084,057</b>	<b>63,770,400</b>	<b>221,720</b>	<b>52,948</b>	<b>13,237,000</b>	<b>Total</b>

**Table 2. Cost Estimates for Discharge Fees**

Notes: <sup>1</sup> Revenue figure for Haifa Chemicals represents 2006 revenues.

<sup>2</sup> Figures are provided for Israel Chemicals Limited (ICL), the parent company of ICL Fertilizers.

<sup>3</sup> Figures are provided for the refining branch of Paz only.

<sup>4</sup> Figures in parenthesis represent losses.

בעל ההיתר	אתר הזרמה	ספיקה שנתית במטרים מעוקבים (מ"ק)	סך ההיטל השנתי המינימלי ( 4 ש"ח למ"ק)	סך ההיטל השנתי המקסימלי (16.75 ש"ח למ"ק)
אגן יצרני כימיקלים	אשדוד	750,000	3,000,000	12,562,500
אומריקס	שפד"ן	600	2,400	10,050
איגוד ערים שפכי דן-בוצה	שפד"ן	5,760,000	23,040,000	96,480,000
אקו אויל	מסוף אלא	157,500	630,000	2,638,125
אשקוגן	אשדוד	33,000	132,000	552,750
בית חולים רמב"ם	חיפה	1,200	4,800	20,100
בני דרום	אשדוד	12,000	48,000	201,000
בתי זיקוק אשדוד	אשדוד	1,575,000	6,300,000	26,381,250
בתי זיקוק חיפה	קישון	5,670,000	22,680,000	94,972,500
גדות אחסון ושינוע	קישון	2,000	8,000	33,500
גדות ביוכימיה	קישון	1,155,000	4,620,000	19,346,250
דינגו	שפד"ן	2,000	8,000	33,500
דלתא טקסטיל	אלא- מפרץ עכו	210,000	840,000	3,517,500
דשנים וחומרים כימיים	קישון	525,000	2,100,000	8,793,750
הוד חפר	חדרה	98,000	392,000	1,641,500
הוד נהדר	חדרה	2,160	8,640	36,180
זוגלובק	מסוף אלא	70,000	280,000	1,172,500
חברת המלח עתלית - בריכות אידוי (ארגד)	עתלית	30,000	120,000	502,500
חברת המלח עתלית - בריכות דגים (ארגד)	עתלית	7,000,000	28,000,000	117,250,000
חברת המלח עתלית - מסופים	עתלית	6,000	24,000	100,500
חברת חשמל- חגית	חדרה	3,500	14,000	58,625
חברת חשמל - אורות רב"ן, חדרה	חדרה	322,000	1,288,000	5,393,500
חברת חשמל - אלון תבור	חדרה	65,000	260,000	1,088,750
חברת חשמל - אשכול, אשדוד	אשדוד	357,000	1,428,000	5,979,750
חברת חשמל - גזר - מים	חדרה	60,900	243,600	1,020,075
חברת חשמל - גזר - תמלחות תעשיות	אשדוד	52,500	210,000	879,375
חברת חשמל - חיפה - מי ים ותמלחות תעשיות	חיפה	141,100	564,400	2,363,425
חברת חשמל - חיפה - מי תהום	חיפה	5,000,000	20,000,000	83,750,000
חברת חשמל - רוטנברג, אשקלון	אשקלון	190,500	762,000	3,190,875
חברת חשמל - רידינג, תל אביב	תל אביב- ירקון	10,000	40,000	167,500
חברת חשמל - רמת חובב	אשקלון	7,200	28,800	120,600
חיפה כימיקלים-מפרץ חיפה	קישון	2,500,000	10,000,000	41,875,000
חקר ימים ואגמים חיפה	חיפה	60,000	240,000	1,005,000
טאוור FAB2	אלא- מפרץ עכו	82,250	329,000	1,377,688
טיב טקסטיל	שפד"ן	720	2,880	12,060
טנא נגה	שפד"ן	61,300	245,200	1,026,775

בעל ההיתר	אתר הזרמה	ספיקה שנתית במטרים מעוקבים (מ"ק)	סך ההיטל השנתי המינימלי ( 4 ש"ח למ"ק)	סך ההיטל השנתי המקסימלי ( 16.75 ש"ח למ"ק)
כרמל אולפינים	קישון	857,000	3,428,000	14,354,750
כרמל כימיקלים	עתלית	7,200	28,800	120,600
מועצת החלב	שפד"ן	6,000	24,000	100,500
מילובן	אלא- מפרץ עכו	550,000	2,200,000	9,212,500
מילומור	שפד"ן	21,600	86,400	361,800
מנחם אורן פרוייקט אורנים	תל אביב מוצא רידינג	796,662	3,186,648	13,344,089
מצבעת תכלת	שפד"ן	1,000	4,000	16,750
נגב טקסטיל	שפד"ן	3,750	15,000	62,813
נמל אשדוד	אשדוד	72,000	288,000	1,206,000
עוף ברכה	שפד"ן	8,400	33,600	140,700
עוף טנא	חדרה	52,500	210,000	879,375
עיריית אשדוד	אשדוד	8,400,000	33,600,000	140,700,000
עיריית הרצליה	מרינה הרצליה- צינור מוצא	8,000,000	32,000,000	134,000,000
פאקא	שפד"ן	40,000	160,000	670,000
קאן טקסטיל	שפד"ן	500	2,000	8,375
קבוצת יבנה	אשדוד	20,000	80,000	335,000
קולבר מופ	שפד"ן	240	960	4,020
קיבוץ מעגן מיכאל - חקלאות ימית	מעגן מיכאל	2,000,000	8,000,000	33,500,000
קיבוץ מעגן מיכאל - תמלחות	מעגן מיכאל	336,000	1,344,000	5,628,000
שרון מעבדות	שפד"ן	660	2,640	11,055
תלמה - יוניליוור בסטפודס	חיפה צינור מוצא	1,750,000	7,000,000	29,312,500
תנובה אלון תבור	שפד"ן	111,600	446,400	1,869,300
תשתיות נפט	חיפה	65,000	260,000	1,088,750
<b>סה"כ</b>		<b>55930542</b>	<b>223,722,168</b>	<b>936,836,579</b>

### **3. Summary and Conclusions**

The discharging of effluents to the sea with a permit, as is the custom in Israel, damages an important public resource. According to the law, the discharging is done without imposing a fine or fee. Article 9A in the Law of Pollution Prevention to the Sea from Land-Based Sources dictates that fines should be levied according to the quantity and quality of the effluent discharged by the permit holder, and that the fines should go to the Fund to Prevent Sea Pollution from Oil. Speaking in economic terms, the implications that arise from this paint a worrying picture in which a market failure is negatively affecting both public health and the environment. Implementation of a discharge fee would result in a reduction of marine pollution by providing an incentive for reducing effluent volumes and improving effluent treatment.

Each year, over 100 permits are given to discharge approximately 50 million cubic meters of effluent and sewage into the sea. The projected total that could be collected from such fines is at the very least, 200 million shekels, and can be upwards of 900 million shekels.

Eight factories, out of the hundred-plus that have permits, were surveyed. Each are essential to the Israeli economy with regards to both their earnings, and their profits in comparison to their discharged effluent and its quality. According to the analysis done for this report, the sum total of fines that would be charged to the factories for their pollution falls between 1.3% and 5.4% of their annual profit and less than 1% of their general earnings. This data is proof that imposing fines, in relation to the factories that were surveyed, is similar to the addition of a small tax on the profits and earnings of the factories.

The findings of this State of the Sea Report also show us, that in respect to the eight factories whose economic indicators were reviewed, the investment in Best Available Technology is an optimal goal and constitutes a very small percent of the annual profit of the companies. These statistics refute any argument from factories that they should be excused from implementing BAT and, from the side of the Permit Committee, that factories are not making sacrifices by using BAT. These arguments are insubstantial and cause a market failure that negatively affects both public health and the environment.

As mentioned in the report, the imposition of fines for discharging effluent will serve as a negative incentive for pollution and a positive incentive for the investment in Best Available Technology for the treatment of effluent. In terms of the investment in the factories, the installation of technological solutions for purification will reduce the amount of effluent discharged to the sea. In addition, the application of a “discharge fee” will lead to both a cutback in water needs for industry, and increase the earnings of the State of Israel.

In analyzing the findings and information of the 2008 State of the Sea Report, the conclusions drawn point to a market failure in giving permits without imposing a fine. This report does not mention the cost to the State because of the damage to the health of residents that are exposed to sea pollution which, according to our understanding, is very high. The report focuses on the economic aspect and implications of not collecting “discharge fees”. Research into the economic cost of the damage to public health, tourism, and work environment should be examined.

**A number of conclusions can be drawn from this report that directly and indirectly influence the environment and economy in Israel:**

1. Implementation of a discharge fee would result in a reduction of marine pollution by providing an incentive for reducing effluent volumes and improving effluent treatment
2. The cost to most major industrial factories, if there was a reasonable effluent discharge fee, would represent only a small percentage of their annual profits.
3. Similarly, implementation of a discharge fee would result in a reduction in the amount of freshwater consumed by industry by providing an incentive for adopting advanced technologies
4. Adopting BAT as a condition for discharge permits, as required by Article 1 of the Law for Prevention of Marine Pollution from Land Based Sources, is feasible.
5. The State Treasury can increase its annual revenues by an amount ranging from 200 million shekels – roughly equal to that of the annual budget of the Ministry of Environmental Protection – to up to 900 million shekels.

The recommendations of this State of the Sea Report for 2008 are as follows:

1. Implementation of a discharge fee as is instructed by Article 9A of the Law for Pollution Prevention from Land-Based Resources in order to create negative incentives for polluting factories.
2. Use of the money from the discharge fee to create a fund to protect and improve the coastal environment such as the Fund to Combat Coastal Oil Pollution.
3. The Permit Committee must demand from those requesting a permit to discharge into the sea to invest a reasonable percentage of their yearly earnings in Best Available Technology (BAT) requirement as part of the condition for permit issuance.

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# Appendixes

## *Prevention of Sea Pollution From Land-Based Sources Law, 1988*

### **Definitions**

1. In this Law:

"convention" means an international convention or any part of it, the subject of which is the regulation of sea pollution prevention from land-based sources, to which Israel is a party;

"permit" means a permit under this Law;

"the Minister" means the Minister of the Environment;

"sea pollution" includes action or fault in violation of section 2;

"sea" means the Mediterranean, the Red Sea, and the Dead Sea, including their coasts up to the fresh water line;

"land-based sources" means any land source including an affixed marine source and excluding vessels as defined in the Prevention of Sea Pollution (Dumping of Waste) Law, 1983;

"waste" means substance of any kind or form;

"sewage" means waste disposed of through flow, including sludge and suspended solids.

### **Prohibitions**

2. No person shall dump or cause to flow into the sea waste or sewage from a land-based source, in order to dispose of them in the sea, directly or indirectly, save under a permit pursuant to this law and the regulations promulgated according to it; provided that a permit shall not be granted to types of waste or sewage forbidden by

regulations according to section 14(a)(1).

### **Permits Committee**

3. (a) The Minister shall appoint a Committee for issuing permits which will include:

(1) a representative of the Minister who shall be the chairman;

(2) a representative of the Minister of Defense;

(3) a representative of the Minister of Health;

(4) a representative of the Minister of Industry and Commerce;

(5) a representative of the Minister of Agriculture;

(6) a representative of the Minister of Tourism;

(7) a representative of the Minister of Transport.

(b) Notice of the appointment and address of the Committee shall be published in Reshumot.

(c) The Committee shall prescribe its working procedures in so far as it is not prescribed under this law; the Committee may delegate powers as to particular types of permits to its chairman or to a team from among its members provided that conditions in a permit which related to the operation of a port shall be prescribed with the consent of the Minister of Transport.

### **Report on permits implementation**

4. A person who has received a permit shall report, in the prescribed manner, the dumping of waste or flow of sewage into the sea respectively.

### **Inspectors**

5. (a) The Minister shall appoint inspectors for the purposes of this Law.

(b) For the purposes of enforcing this Law an inspector may enter any place from which he has reasonable grounds to believe that waste is dumped or sewage flows into the sea. However, he shall not enter:

(1) a place used for residence only except under a court order;

(2) a place held by the Defense Forces, except with the permission of the Minister of Defense or whomever he has authorized.

(c) When entering a place as described under section (b), an inspector may take samples of any waste or sewage which may, in his opinion, cause the pollution of the sea, or which may be used as evidence of an offense according to this Law; the aforesaid samples may be tested in a laboratory or treated in any other way.

(d) The Minister of Police may empower an inspector to carry out investigations and searches in order to prevent or to discover offenses against this Law; in exercising such power:

(1) the inspector may exercise any power vested in a police officer of the rank of inspector by section 2 of the Criminal Procedure (Evidence) Ordinance, and section 3 of that Ordinance shall apply to a statement taken down by him by virtue of such

power;

(2) for the purpose of section 24(a)(1) of the Criminal Procedures (Arrest and Search) Ordinance (New Version), 1969, an inspector shall be considered a police officer.

### **Penalties**

6. (a) A person who contravenes the provisions of section 2 shall be liable to imprisonment for a term of one year or a fine of fifty thousand new shekels; and if the offense continues he shall be fined an additional one thousand new shekels for each day the offense continues after his conviction.

(b) A person who contravenes any other provision of this

Law or any regulation promulgated according to this Law or a permit granted pursuant to this Law shall be liable to a fine; and if the offense continues he shall be fined an additional one hundred new shekels for each day the offense continues after his conviction.

(c) Wherever an offense under this Law was committed by a corporation, any person serving as an active manager, partner (other than a limited partner), or officer of the corporation responsible for the aforementioned matter when the offense took place shall be charged with the offense, unless he has proven that the offense was committed without his knowledge, and that he has taken all reasonable measures to ensure the fulfillment of this law.

### **Defense**

7. It shall be a good defense in proceedings for an offense under section 2 if it can be proven that the dumping or flow of waste into the sea was necessary due to an accident or damage, or due to a real

danger to human life; and that all reasonable measures were undertaken to prevent the dump or flow of waste into the sea.

Complaint 8. A complaint as described under section 68 of the Criminal Procedure Law, 1982 will not be submitted unless:

(1) the complainant is one of the following:

(a) any person -- for an offense that was committed in his private domain or which caused damage to his property;

(b) a local authority -- for an offense committed within its jurisdiction;

(c) any of the public or professional bodies determined by section 100(3) of the Planning and Building Law, 1965.

(2) the complainant notified the Minister of his intention to submit a complaint and within 60 days an indictment was not filed by the Attorney General.

(3) the offense which is the subject of the complaint did not occur within the limits of a port as defined in the Ports Ordinance (New Version), 1971.

#### **Order for cleaning expenses**

9. (a) A court that convicted a person of an offense under this Law may, in its sentence, in addition to any other penalty it may impose, order him to pay all or part of the expenses as described hereinafter, whatever the amount, if an application is submitted by the person who incurred them:

(1) expenses for cleaning the sea, the beach and all objects which were polluted by the dumping of waste or the flow of sewage;

(2) expenses incurred for locating the waste that was dumped or caused to flow into the sea in order to prevent the spread of the sea pollution and in order to reduce the amount of damage caused.

(b) Where more than one person is convicted of an offense, the court may, in its decision under this section, impose the payment of the expenses on all or some of them, jointly or severally, or it may apportion the sum among them, as it deems proper according to the situation.

(c) Where the court does not give a substantive decision on an application under this section, such fact shall not derogate from the right of the person who incurred the expenses to claim them in an ordinary action.

#### **Destination of fines**

10. Fines imposed for an offense under this Law shall be paid to the fund established under section 13 of the Prevention of Sea Water Pollution by Oil Ordinance (New Version), 1980.

#### **Conditioning of licenses**

11. The granting of licenses according to the Licensing of Businesses Law, 1968, according to any law for the building or managing of a plant shall be regarded as dependent on fulfilling the provisions of this law.

#### **Saving of laws**

12. The provisions of this Law shall not derogate from any other law.

#### **Applicability to State**

13. This law shall apply also to the State.

#### **Implementation and regulations**

14. (a) The Minister is responsible for the implementation of this Law and he may, with the approval of the Interior and Environmental Committees of the Knesset, promulgate regulations in the following matters:

(1) types of waste and sewage which may not be dumped or caused to flow into the sea;

(2) conditions for the issue of permits;

(3) procedures for the issue, renewal, alteration or cancellation of permits;

(4) any other matter regarding implementation of this Law.

(b) Regulations according to subsections a(1) and (2) shall be promulgated according to the provisions of Conventions.

(c) The Minister, with the consent of the Minister of Finance and the approval of the Interior and Environmental Committees of the Knesset, may promulgate regulations regarding the imposition of fees for the application for issue of a permit or for its renewal, and regarding the destination of those fees.

#### Amendment of the Criminal Procedure Law

15. The following shall be added at the end of the second annex to the Criminal Procedure Law (Consolidated Version), 1982:

"14. An offense under section 2 of the Prevention of Sea Pollution from Land Based Sources Law, 1988, subject to the restrictions specified in section 8 of the aforementioned law."

*Prevention of Sea Pollution From Land Based Sources  
Regulations, 1990*

By the authority vested in me under Section 14 of the Prevention of Sea Pollution from Land Based Sources Law, 1988, (hereinafter, "the Law"), and with the approval of the Interior and Environmental Committee of the Knesset, I hereby promulgate the following regulations:

**Definitions**

1. "permit application" includes an application for the renewal of a permit;

"best available technology economically achievable" means the best up-to-date technology existing for the prevention of sea pollution which is in use and economically achievable;

"the Committee" means the Permits Issue Committee as appointed under Section 3 of the Law;

"a permit" means a permit to dump waste or cause sewage to flow into the sea from a land-based source in order to dispose of them in the sea;

"land-based source" is as defined by the Law, in which waste or sewage that may cause sea pollution are created or processed.

"monitoring" means sampling and checking, continuously, periodically or occasionally.

**Application for permit**

2. An application for a permit shall be submitted to the Committee in writing and shall include the details specified in Annex One; submission of information according to sections 5 and 6(1) of Annex One shall be limited to information within the knowledge of the applicant.

### **Completion of the application**

3. (a) The Committee may request further information from the applicant in addition to the information submitted according to Regulation 2, if, in its opinion, the additional information is necessary for the processing of the application. The Committee may request the applicant to submit data, test results or a professional opinion.

(b) A request as described under Sub regulation (a) shall be presented to the applicant not later than 45 days from the submission of the application.

### **Consideration and decision concerning application**

4. (a) The Committee shall consider and decide upon an application within 75 days of its submission, and in the case of a request under Regulation 3, of the submission of the additional data requested.

(b) The chairman of the Committee may, at the applicant's request, decide upon closed-door confidential Committee deliberations.

(c) The Committee may approve an application with or without conditions or deny it.

(d) When the Committee has decided to approve an application, the chairman of the Committee shall grant the permit to the applicant as soon as possible.

(e) When the Committee has decided to deny an application, the chairman of the Committee shall inform the applicant in a written, justified notification.

(f) The Committee may reconsider terms specified in a permit or an application that it denied, if requested to do so by a Committee member or by the applicant in a written application.

### **Application Fee**

5. The applicant shall pay an application fee for filing an application for a permit.

### **Prohibition to grant a permit**

6. The Committee shall not allow the dumping or flowing of waste or sewage in the following cases:

(1) If there are, in its opinion, on-land waste or sewage treatment or disposal alternatives, or methods for waste or sewage re-use, or appropriate low-waste technology alternatives provided that these alternatives are usable, economically achievable and less harmful to the environment.

(2) The waste or sewage contain substances among those listed in the second Annex and the provisions of Regulations 7(2) or (3) are not sustained.

### **Granting a permit**

7. The Committee may allow waste or sewage to be dumped or caused to flow into the sea if:

(1) they do not contain substances listed in the second Annex;

(2) they do contain substances listed in the second Annex but the applicant has proved, to the satisfaction of the Committee, that the best available technologies existing for treatment of waste or sewage have been utilized prior to the dumping;

(3) there is no reasonable technical possibility of preventing the dump or flow due to an extraordinary event.

Materials that may not be dumped or caused to flow into the sea: the list of substances specified in this section is based on the Protocol for the Protection of the Mediterranean Sea Against Pollution From Land Based Sources, the Annex to the Convention for the Protection of the Mediterranean Sea Against Pollution, Barcelona, 1976, and is translated here in full:

1. The following substances, families and groups of substances...have been selected mainly on the basis of their toxicity, persistence and bio-accumulation:

- (1) Organohalogen compounds and substances which may form such compounds in the marine environment;
- (2) Organophosphorus compounds and substances which may form such compounds in the marine environment;
- (3) Organotin compounds and substances which may form such compounds in the marine environment;
- (4) Mercury and mercury compounds;
- (5) Cadmium and cadmium compounds;
- (6) Used lubricating oils;
- (7) Persistent synthetic materials which may float, sink or remain in suspension and which may interfere with any legitimate use of the sea;
- (8) Substances having proven carcinogenic, teratogenic, or mutagenic properties in or through the marine environment;
- (9) Radioactive substances, including their wastes, when their dump or flow do not comply with the principles of radiation protection as defined by the competent international organizations, taking into account the protection of the marine environment.

Note: in subsections (1), (2), and (3), materials which are biologically harmless or which are rapidly converted into biologically harmless substances are excepted.

2. Substances, families and groups of substances or sources of pollution as detailed in annex II to the Protocol...while taking into account that they are generally less noxious or are more readily rendered harmless by natural processes:

- (1) The following elements and their compounds: zinc, copper, nickel, chromium, lead, selenium, arsenic, antimony, molybdenum, titanium, tin, barium, beryllium, boron, uranium, vanadium, cobalt, thallium, tellurium.
- (2) Biocides and their derivatives not covered in annex I [of the Protocol];
- (3) Organosilicon compounds and substances which may form such compounds in the marine environment, excluding those which are biologically harmless or are rapidly converted into biologically harmless substances;
- (4) Crude oil and hydrocarbons of any origin;
- (5) Cyanides and fluorides;
- (6) Non-biodegradable detergents and other surface-active substances;
- (7) Inorganic compounds of phosphorus and elemental phosphorus;
- (8) Pathogenic microorganisms;
- (9) Thermal discharges;
- (10) Substances which have a deleterious effect on the taste or smell of products for human consumption derived from the aquatic environment, and compounds liable to give rise to such substances in the marine environment;
- (11) Substances which have, directly or indirectly, an adverse effect on the oxygen content of the marine environment, especially those which may cause eutrophication;
- (12) Acid or alkaline compounds of such composition and in such quantity that they may impair the quality of sea water;
- (13) Substances which, though of a non-toxic nature, may become harmful to the marine environment or may interfere with any legitimate use of the sea owing to the quantities in which they are dumped.