October 12, 2009

Robert K. Sweeney, Chairman  
Assembly Committee on Environmental Conservation  
Room 625  
Legislative Office Building  
Albany, NY 12248

Dear Chairman Sweeney and members of the committee:

Thank you for the invitation to appear at the October 13th hearing of the Assembly Standing Committee on Environmental Conservation regarding methods to reduce mercury exposure.

Attached are my written comments, in response to your selected issues to which witnesses may direct their testimony.

Please don’t hesitate to contact me if you, or your staff, have questions or any follow up requests.

Sincerely,

Michael Bender, Director
1. What is the nature and extent of mercury pollution in New York?

Mercury is an extremely toxic metal that is now ubiquitous in the environment due to decades of unchecked releases. New York state shares in the burden of excess mercury pollution in its environment and in the fish New Yorkers eat. Mercury is a persistent, bioaccumulative toxin (PBT) and a transcontinental pollutant that, once airborne, gets deposited in pristine locations far from civilization. The U.S. Environmental Protection Agency (EPA) Mercury Study Report to Congress in 1997 and the United Nations Global Mercury Assessment report in 2001—and numerous other studies—have documented the prevalence of mercury and its many associated problems and challenges in New York State and around the globe.

Mercury pollution that gets emitted into the air and water can transform into methylmercury, end up in our food chain, and accumulate in fish. Methylmercury is a potent neurotoxin, causing damage to the nervous system even at low levels of exposure. Children exposed to mercury have shown delays in learning to walk and talk, delayed fine motor skill development, and attention deficit disorders. Mercury can pass from mother to child through the placenta and breast milk.

The EPA has estimated that one out of six women of child-bearing years in the U.S. has unsafe levels of mercury in her blood. Based upon this, as many as 630,000 children are born in the U.S. each year with a heightened risk for health effects related to mercury exposure. Mercury also poses problems for adults, with recent studies linking mercury exposure to cardiovascular and reproductive problems in adults. Effects on wildlife also have been documented extensively, where mercury interferes with the healthy reproduction and behavior of fish-eating predators.

2. What steps should be taken to reduce exposure?

To the extent possible and over the long run, all uses of mercury should be eliminated in New York and worldwide, and releases curtailed or eliminated. Trade in mercury should be banned, and a strong and effective legally binding treaty on mercury should be adopted by the world’s governments in 2013. Leading up to and after adoption of a strong mercury treaty, both national governments and also regional, state and local governments have a responsibility to reduce and eliminate mercury uses and releases, and also to take steps to protect their populations from mercury exposure risks. In particular, the fish-eating public should be effectively informed of exposure risks from the consumption of mercury-contaminated fish, and others who come into contact with other forms of mercury sources should also be warned of risks.

New York State has already issued a consumption advisory warning the public about exposure risks from eating certain species of freshwater fish; however, it is not clear whether this information has been adequately conveyed to the public. Federal agencies have also issued a consumption advisory warning about exposure risks from eating marine fish; unfortunately, there is a general lack of knowledge of it. Therefore, the New York State Department of Health, and local health agencies should “ramp up” their respective outreach strategies and improve the
effectiveness of their risk communication strategies relating to the consumption of both freshwater and marine fish. An important focus of this effort should be on-going outreach, particularly to women of child-bearing age, pregnant women, nursing mothers and young children and sub-populations known to consume higher than average amounts of high-mercury fish such as swordfish, shark, and fresh and canned tuna.

3. It has been suggested that mercury reductions in New York will not result in a direct environmental benefit due to the presence of emissions from other states and countries. Please explain whether you agree or disagree with this statement and why.

We strongly disagree with this statement for several reasons, as explained below.

First, several studies have documented reductions in mercury levels in freshwater fish have been due to mercury reduction initiatives in the Northeast, in the South and abroad. One of these studies involved New York State officials, since they are members of the groups that released the study. According to their September 2007 report, *Northeast States Succeed in Reducing Mercury in the Environment*, compiled by the New England Interstate Water Pollution Control Commission, Northeast States for Coordinated Air Use Management, and Northeast Waste Management Officials’ Association:

> Reductions in mercury levels in fish can be accomplished through placing air pollution control devices on smokestacks or by reducing the amount of mercury that reaches incinerators, which can be achieved through programs to collect, recycle, and reduce use of mercury-containing products.

Second, while efforts to cut mercury emissions from power plants (estimated at 48 tons annually, the largest source in the U.S.) are expected to soon be addressed nationally by EPA’s new mercury rule, the second largest source of mercury is the disposal of mercury-containing products is not being addressed at the federal level. Working in collaboration with many groups around the country, there are three high-priority product categories, based on their contribution to the mercury problem, that New York State can and should address through the adoption of new statewide mercury reduction and elimination policies.

The first category – switches, relays, and measuring devices (including thermostats) – accounts for the largest use of mercury in products by far, recently accounted for approximately 193 tons of mercury used annually as demonstrated in the pie chart below from a 2004 EPA study entitled *International Mercury Market Study and the Role and Impact of U.S. Environmental Policy*. While this amount has decreased since this study was prepared, largely due to state legislation

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(see discussion below), these product categories still consume the highest amount of mercury in products.

As awareness of the mercury problem grows, many states have adopted policies to phase out the use of mercury-containing products. As discussed below, 11 states (not including New York) have comprehensive sales bans. Accordingly, manufacturers are finding it more cost effective to make only mercury-free devices. In fact, non-mercury alternatives are available that are comparable in cost to their mercury equivalents for switches, relays, and measuring devices (including thermostats) with very limited exceptions. We believe that when all the laws that have been passed are in effect, states will have helped reduced the amount of mercury in products sold in the U.S. each year from the previous 276 tons in 2004 to between 50 to 60 tons in the very near future, assuming New York completely joins this effort.

As discussed in more detail further below in our response to question 5, New York State can and should do much more through legislation to effectively phase out the use of mercury in many products where there are viable and cost-effective mercury-free alternatives. In addition, New York State can also work collaboratively with many other states to improve the collection of mercury from several high-priority products, such as auto switches and thermostats.
4. Explain the costs and benefits of mercury reductions

Numerous reports have documented the environmental and economic benefits of mercury reduction policies and programs. For example, a study by Trasande et al. found that benefits of mercury reduction across the country are $1.3 billion per year.²

5. Are the existing provisions regarding the inclusion of mercury in products such as packaging, batteries and novelty products adequate, or are more restrictions necessary?

As recommended and explained in detail below, more restrictions on the sale and use of mercury-added products are necessary.

a) Strengthen New York State’s mercury products phase-out law.

In 2005, New York State adopted a law phasing-out the sale of mercury-added consumer products. However, due to a loophole in the law, thermostats and other products with mercury switches and relays can still be sold in New York State. We support closure of this loophole, and recommend expanding the types of products that are covered in the law to ensure all relevant switches, relays, and measuring devices are covered.

As mentioned above, the largest amount of mercury used to manufacture products is used to produce mercury switches and relays. This product category is estimated to account for almost half of the mercury consumed in product manufacturing here in the U.S. Moreover, some of these products contain very large quantities on a per unit basis – up to 4 grams of mercury per switch (or about 800 times more than the 5 mg of mercury in a typical CFL) and up to 153 grams per relay.

For this reason, many states have targeted switches and relays as a priority for action to minimize mercury use. Not counting New York, 11 states now have passed legislating prohibiting the sale of new mercury switches and relays, except for certain replacements in existing equipment. These states are California, Connecticut, Illinois, Louisiana, Maine, Massachusetts, Minnesota, New Hampshire, Rhode Island, Vermont, and Wisconsin (enacted this year).³ Other states – such as Maryland and Michigan – have specifically prohibited sales of mercury thermostats.

Under each of the more comprehensive state laws, state agencies are authorized to grant time-limited exemptions to the sales prohibition in the rare instances where functional non-mercury


³ These state laws also apply to the sale of non-fever mercury thermometers, also covered by the February 2009 DEC decision, as discussed below. The arguments presented here in favor of revising NY law applies equally in the case of mercury measuring device sales not already prohibited under NY law.
alternatives are not available at comparable costs. Most of these states have coordinated their review of the small number of exemption applications received through the Interstate Mercury Education and Reduction Clearinghouse (IMERC) established under the auspices of the Northeast Waste Management Officials’ Association (NEWMOA). Significantly, relatively few exemptions have been granted because of the wide availability of effective, non-mercury alternatives.

Unfortunately, DEC has interpreted the existing New York mercury products law as not authorizing the agency to similarly exempt this small number of switches and relays warranting an exemption. Accordingly, DEC believes it must find that every switch and relay within specified subcategories has a non-mercury alternative before a sales prohibition on the entire subcategory can be imposed. In effect, DEC interprets NY State law as preventing a sales ban for 99% of switches and relays within each subcategory because an exemption may be required for the remaining 1% or less of a given subcategory. Accordingly, on February 9, 2009, it declined to impose a sales ban for mercury wetted relays, flame sensors, thermostats, and non-fever thermometers even though such sales bans are already in effect in many other states without incident and DEC found only limited exceptions would be required.

This result is absurd. Perhaps the best illustration of this absurdity is thermostats, where the largest U.S.-based mercury thermostat manufacturer, Honeywell, has stopped making mercury thermostats and now only produces non-mercury alternatives. Consequently, there are many more (functionally superior) non-mercury thermostat models available for purchase than there are mercury models.

As a member of NEWMOA, DEC can easily participate through IMERC in reviewing exemption applications efficiently and effectively. New York State law should be revised in a manner consistent with other states to impose a generally applicable sales prohibition on switches, relays, and measuring devices, and authorize DEC to grant limited exemptions like the other states. The Legislature needs to make these revisions to avoid the absurdities resulting from the perfect being the enemy of the very good.

b) Adopt legislation in New York requiring incentivized collections for mercury thermostats.

We strongly recommend that the New York Legislature pass “bounty” legislation for thermostat collection and recycling based on the successful laws in Maine⁴ and Vermont⁵. Thermostat

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⁴ Maine thermostat legislation: [http://www.productstewardship.us/associations/6596/files/Maine%20thermostat%20law%20FINAL%203-30-06.doc](http://www.productstewardship.us/associations/6596/files/Maine%20thermostat%20law%20FINAL%203-30-06.doc)

⁵ VT thermostat law: [http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2008/acts/ACT149.HTM](http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2008/acts/ACT149.HTM)
recycling laws in place in both these states have dramatically increased collection rates and successfully removed thousands of mercury thermostats from the waste stream to ensure their proper recycling. These laws require manufacturers to pay a $5 bounty for each mercury-added thermostat they collect as an incentive for contractors and homeowners to bring them in, rather than dumping them in the trash, which can release mercury into the environment.

Due to the long life of mercury thermostats, many still remain in service in residential, institutional, and commercial locations. Mercury thermostats can contain up to 4 grams of mercury per thermostat. While sales of mercury-containing thermostats are on the decline as manufacturers have largely shifted production to more energy-efficient, non-mercury digital thermostats, an estimated 50 million mercury-containing thermostats are still in use in homes throughout the United States.

According to a 2004 study by EPA (mentioned above), more than 10 percent of the estimated mercury reservoir in the United States is in thermostats. As the popularity of electronic programmable thermostats grows, more of these in-service mercury thermostats will be removed from service in all likelihood. Thousands of thermostats are coming off the wall every day. If not collected and recycled now, the potential for capturing this significant source of mercury will be forever lost.

Over 10 years ago, three thermostat manufacturers created a voluntary industry-funded take-back recycling program, focused on collecting thermostats primarily from HVAC contractors; however, the program has not achieved a high capture rate for a variety of reasons. A June 2008 NEWMOA report on thermostat collection in New England found that only about 6% of discarded mercury-added thermostats are recycled in Massachusetts.

NEWMOA issued another report for the Commonwealth of Massachusetts that reviewed thermostat collection and recycling programs to determine best practices. The report recommends four characteristics of successful programs, namely: 1) a mandated financial incentive for contractors and homeowners that collect and recycle thermostats, 2) an effective education program about disposal ban requirements, 3) accessible and convenient collection sites, and 4) outreach about the environmental and health benefits of thermostat recycling.

NEWMOA’s review of the experiences in other states found that the most successful mercury thermostat collection and recycling efforts include mandated financial incentives and education

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6 Thermostat switches contain about three grams of mercury per switch, and because some thermostats contain multiple switches, the average thermostat contains about four grams of mercury. While there are no authoritative estimates of the number of mercury thermostats discarded annually, trade data indicate about 9,000,000 residential replacement thermostats were sold in 2002. If only 75% of the thermostats replaced mercury-containing models, this amounts to 6.7 million units containing over 29 tons of mercury.

programs to encourage participation (such as those adopted by Maine and Vermont). Two provisions of model legislation designed to address mercury in consumer products stand out as particularly important: the financial incentive (bounty) it provides to anyone who returns a mercury-containing thermostat for recycling, and the goal it establishes for collection and recycling of out-of-service mercury thermostats.

**Financial Incentives**

The weight of the evidence indicates a clear causal relationship between providing a bounty and achieving results. In 2006, the Product Stewardship Institute ran a pilot program in Oregon that offered $4.00 to any contractor who brought in a discarded mercury thermostat. By the end of the pilot, the number of thermostats collected in Oregon more than doubled from 2,052 in 2005 to 4,587 in 2006. When the pilot was discontinued, the number of thermostats collected dropped significantly even though contractors were still allowed to continue recycling thermostats without an incentive. Similar results were found in pilot incentive programs run by King County (Washington) and the Vermont Department of Environmental Conservation (VT DEC).

The VT DEC conducted a two-month mercury thermostat collection pilot project\(^8\) directed at households to test the effect of a financial incentive on increasing the rate of mercury thermostat recycling. Eighty-six hardware stores served as collection points throughout the state during the months of October and November. A cash incentive was provided in the form of $5.00 off the purchase of anything in the participating store where the thermostat was returned. VT DEC paid for the program through its special fund for mercury reduction projects. The Thermostat Recycling Corporation (TRC) provided the collection bins as well as transportation and recycling services at no charge to the stores. VT DEC arranged for newspaper and radio advertisements and in-store advertising materials.

Almost 1,200 mercury thermostats were collected during the two-month program. The majority of thermostats were brought in by homeowners, but some thermostats were returned by contractors. In comparison, there were 192 mercury thermostats delivered to municipal solid waste districts during a two-and-a-half month period prior to the pilot. The collection numbers significantly exceeded total yearly collections at TRC wholesaler locations, where a financial incentive was not offered.

The number of thermostats collected in the two-month pilot represents 40–60% of the thermostats estimated to be available for collection on a yearly basis as estimated by VT DEC in its 2006 report to the Legislature. This surpassed Vermont’s collection prior to the initiation of the bounty program by more than five-fold.

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\(^8\) VT DEC report to the State Legislature, which showed that the pilot bounty collection program clearly worked: [http://www.productstewardship.us/associations/6596/files/VT_Thermostat_FINAL.doc](http://www.productstewardship.us/associations/6596/files/VT_Thermostat_FINAL.doc)
Performance Goals

A number of states have passed laws requiring either bounty programs or performance standards that must be met (otherwise bounties would kick in). The performance goal of a specified percentage collection rate is critically important for two reasons. First, it establishes expectations for the success of the program. Second, it stipulates that the State will assess performance based on a collection rate, that is, the number of thermostats collected compared to the number available for collection. A collection rate places the number of thermostats collected into context. Without performance goals based on collection rates, it is impossible to know how well a mercury thermostat collection and recycling program is working and whether a program is capturing sufficient quantities of mercury thermostats to reduce risks to acceptable levels.

Manufacturers argue that basing performance on a collection rate is ill advised because no one knows the precise number of mercury thermostats available for collection and recycling. The Product Stewardship Institute is addressing that problem by helping a coalition of more than a dozen states develop a common methodology for calculating mercury thermostat collection rates.

In summary, legislation is needed in New York State to substantially strengthen the ineffective voluntary system for mercury thermostat collection and recycling currently in place. New York should require manufacturers to accept responsibility for their toxic products and ensure that mercury thermostats are safely collected and recycled when they are removed from use. Requiring manufacturers to pay for the collection and disposal of thermostats takes the burden off local governments, and reduces pollution and liability issues for the public. It also sends the right economic signal that manufacturers should be responsible for the products they put into the market and encourages them to produce less hazardous or non-hazardous products in the future.

c. Through legislation, establish mercury-content standards for light bulbs sold in the state and offered on State contracts for goods and services

As California and Maine have already done, we recommend legislation be adopted in New York state to set strict mercury-content standards on lamps sold to the general public as a first step toward addressing mercury releases from lamps throughout their life-cycle. Reducing the mercury content of lamps will have two positive affects. First, it will reduce the amount of mercury used and lost during the manufacturing process. In a recent report, China’s environmental agency estimated half of the mercury used in the older, liquid insertion processes did not wind up in the lamps themselves. Therefore, tighter limits on mercury content can force the phase-out of the older dosing methods, resulting in reduced mercury usage from both lesser production losses and less mercury in the lamps. Second, by reducing the mercury content of lamps, less mercury is available for release should the lamp break during transportation, use or waste handling.
Specific language recommendations read as follows:

“The Department shall adopt rules establishing mercury content standards for lamps sold or manufactured in the State of New York on or after January 1, 2012. The standards shall be based on the most stringent lamp mercury content standards established in other states, and shall be revised as needed to reflect the promulgation of new state standards. If one or more categories of lamps are not covered by other state mercury content standards, the Department may adopt standards minimizing the mercury content of lamps within such categories, including adoption of a no-mercury standard when non-mercury alternatives are available at comparable costs.”

Background

The United States, like many other developed countries, is a net importer of mercury-containing lamps because much of the global lamp production is located in developing countries such as China and Mexico. Over 40% of US lamp sales are imported, and over half of the imports are from the Asia/Pacific Region. This trend can be expected to continue due to rising sales of compact fluorescent lamps (CFLs), most of which are manufactured in China. A recent study found that China used about 64 million tons (MT) of mercury to manufacture approximately 3 billion lamps in 2005.

In 2006, sales of fluorescent lamps in the US approached 1 billion units, and sales of high-intensity discharge (HID) lamps reached about 125 million. Linear fluorescent lamps (LFLs) accounted for more than half of fluorescent lamp sales. Experts predict CFL sales will surpass LFL sales in the U.S. by 2011, as LFL sales increase slightly but CFL sales triple due to increasing residential use. Whether these and corresponding global production increases bring parallel increases in global mercury consumption will depend upon whether efforts to minimize the mercury content in each lamp are successful.

While the mercury content of individual lamps is often relatively small, cumulatively, they are an important source of mercury releases because they are high-volume items that are very fragile. Therefore, their mercury content can easily be released into homes, institutions and the environment at large.

The amount of mercury in lamps varies by lamp type and manufacturer. It varies by lamp type because of the functional properties and characteristics of the various kinds of lamps. It varies by manufacturer because of the techniques and quality control mechanisms used to dose the lamps with mercury. Many LFLs are currently in the 5-10 mg range, while a sizable percentage of lamps (mostly older less-efficient models such as T12s and “preheat” fluorescents) contain 10-50 mg of mercury. However, the most advanced LFLs (such as modern T8s and T5s using electronic ballasts) contain less than 2 mg of mercury.
CFLs tend to have relatively low amounts of mercury. For screw-in CFLs, National Electronic Manufacturing Association (NEMA) members recently voluntarily committed to a cap of 5 mg of mercury for models using less than 25 watts, and to a cap of 6 mg of mercury for 25-40 watt CFLs. However, at least two major manufacturers currently make CFLs containing less than 2 mg of mercury. Canadian and US eco-labeling organizations currently use a 3 mg mercury-content limit for CFLs.

For HIDs, there is a similar disparity in mercury content that differs by type and manufacturer. Most HID lamps (used for roadways, parking lots, warehouses) are in the 20-100 mg range, although some high-wattage varieties (such as metal halide stadium lights) contain up to 1 gram of mercury. Conversely, others contain less than 10 mg of mercury, and one manufacturer has developed a line of mercury-free HIDs.

Another category of lighting equipment that tends to contain a substantial amount of mercury is neon tubes, which are mostly used to manufacture illuminated signs. Most neon – other than red – contains approximately 200-600 mg per linear foot. Vermont has banned the sale of mercury-containing neon signs in the state.

One reason for the disparity in mercury content is the method used to insert mercury into the lamp. The newer, more efficient “dosing” methods use a mercury pellet or amalgam where the amount of mercury inserted can be more precisely controlled than the older methods, where liquid mercury is inserted via a drip or spray injection technique. Significantly, the older methods also lose more mercury in the production process. As noted above, China’s environmental agency estimated half of the mercury used in the older, liquid insertion processes did not wind up in the lamps themselves. Therefore, tighter limits on mercury content can force the phase-out of the older dosing methods, resulting in reduced mercury usage from both lower production losses and less mercury in the lamps.

The European Union (EU), through its Restriction of Hazardous Substances (RoHS) Directive, has been the most active government entity setting mercury limits on lamps. At the present time, the EU has a 5 mg limit for most CFLs, and a 5-10 mg limit for most LFLs. More importantly, the EU recently began a process of revising and significantly lowering these limits. For example, under new proposed RoHS limits, most CFLs and linear fluorescent T8 lamps will not be allowed in the European marketplace if they have more than 3.5 mg of mercury. This process should be completed in 2009, with the new limits expected to take effect in 2012.

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However, in the US, there are no federal regulatory limits on lamp mercury content, and only a few limits exist at the state and local levels. The most significant state standards can be found in California law\textsuperscript{11}, which requires, effective January 1, 2010, that any lamp manufactured or offered for sale or sold in California, meet the applicable standards under the EU RoHS Directive, as amended. A similar law was recently enacted by the State of Maine.

Other states and local government have adopted policies directing their purchasing department and other agencies to establish environmental standards for lighting equipment offered on their contracts. For example, in 2005, the City of New York enacted Local Law 120, which states the following:

\begin{quote}
Any mercury-added lamp purchased or leased by any agency shall achieve no less energy efficiency than the minimum required by the director through rulemaking and among lamps meeting such energy efficiency requirements shall contain the lowest amount of mercury per rated hour.\textsuperscript{12}
\end{quote}

Finally, the State of New York should codify its commitment to purchasing the most environmentally preferable lighting equipment for its own operations. We applaud Governor Paterson for issuing an executive order\textsuperscript{13} designed to maximize the use of “green” commodities, services and technologies, including those that minimize the use of toxic substances, increase energy efficiency and reduce waste. In addition, we recognize that the New York State Office of General Services appears to be moving forward with the adoption of some environmental specifications for its lighting equipment pursuant to this EO.

However, comprehensive, environmental specifications, which allow vendors to only offer their most energy-efficient, low-mercury, long-lasting lighting equipment, were issued by the State of Oregon this year. Oregon not only set environmental standards on lamps, ballasts and lighting fixtures, it also prohibited vendors from offering outdated lighting equipment. While New York State may follow Oregon’s lead and issue similar contract specifications this year, it is important for the State Legislature to adopt a policy committing the State to establishing mercury-content and energy efficiency standards guiding all of its lighting equipment acquisitions. This will ensure that the State’s decision to purchase low-mercury, high-performance lighting equipment is applied to all purchasing decisions and not reversed by subsequent administrations.

By offering high-performance, low-mercury, long-lasting lighting equipment as well as cost-

\begin{flushleft}\textsuperscript{11} See AB 1109 (Huffman), Lighting Efficiency and Toxics Reduction Act, \url{http://www.leginfo.ca.gov/pub/07-08/bill/asm/ab_1101-1150/ab_1109_bill_20071012_chaptered.pdf}.
\textsuperscript{12} Local Law 120 to Amend the Administrative Code of the City of New York, in Relation to the Reduction of Hazardous Substances in Products Purchased by the City, \url{http://www.nyc.gov/html/nycwasteless/downloads/pdf/laws/law05119.pdf}.
\textsuperscript{13} See EO #4 No 4: Establishing a State Green Procurement and Agency Sustainability Program, \url{http://www.state.ny.us/governor/executive_orders/exeorders/ eo_4.html}.
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effective lamp recycling services on its contracts, the State will not only reduce its own environmental footprint and save money, it will also make it easier for local governments, school districts and other State contract users to buy these products at discounted prices.