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# **The Environmental Impact & Other Potential Risks Associated With Bottled Drinking Water**

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# Outline

- ❑ Interesting facts about water & plastic
- ❑ How big is the problem?
- ❑ Why should we care?
- ❑ But... is there an alternative?
- ❑ Closing remarks & your questions/  
comments



# Did You Know?

## Fresh Water

- ✓ More than 97% of all water on Earth is salt water
- ✓ That leaves less than 3% fresh water
- ✓ But 70% of that fresh water is frozen
- ✓ ***Less than 1%*** of all water on Earth is fit for all living things (except sea life), which includes human use and consumption!!

***Fresh water is very rare and must be conserved***





# Did You Know?

## Plastic

- ✓ Plastic is made from oil
- ✓ While most plastics used to make bottles are recyclable, most of the time they are not recycled
- ✓ To fill a 1-liter bottle, as much as 3 liters of water are consumed
- ✓ Transporting bottles to/from your home or school consumes fuel
- ✓ Plastic bottles dumped in a landfill take up lots of space and can also take as long as 1,000 years to completely degrade
- ✓ If incinerated, trash again consumes energy (burning oil or gas)

***Bottled water has a BIG environmental impact***



# How big is the problem?

Numerous articles and studies from reliable sources have been published regarding the actual environmental impact of using bottled water.

Let me quantify some of the key areas: (without necessarily prioritizing them)

- In the U.S. alone, some **32 Billion** plastic drinking water bottles were sold in 2009  
→ *In the U.A.E., more than **750 Million** bottles a year – 3<sup>rd</sup> highest in the world.\**
- The crude oil production that goes into making the plastic bottles... approx. **30 Million** barrels of oil in the U.S. alone → *U.A.E. equiv. **700 Thousand** barrels.*
- The energy used in water treatment (desalinate/purify/disinfect) as well as the production processes at the bottling plant. This has been estimated at roughly **0.25 Liter** of oil for each Liter of drinking water.  
→ *For the U.A.E., that would add another **500 Thousand** barrels.*
- The fuel consumed by delivery trucks (or your own car) to transport the water to/from your home or school adds as much as **0.10 Liter** of fuel per Liter of drinking water & more than 5-20 times or more that amount for imported water.

\* Refer to Appendix 3

Sources: Container Recycling Institute, Beverage Marketing Corporation, Earth911.com, The Economist, others.



# Why should we care?

The biggest issue is arguably the recycling of the plastic used in practically all sources of bottled water... just imagine the volume of waste generated by bottles that aren't recycled.

Here are some more thought-provoking U.S. stats, where it is estimated that:

- 8 out of 10 plastic bottles end up in a landfill (not recycled or incinerated).
- Only about 20-30% of plastic bottles are recycled, higher in some states than others.
- Less than 1 percent of all plastics is actually recycled.
- It is estimated that the production of plastics accounts for 4% of total U.S. energy consumption.
- Recycling a single plastic bottle can conserve enough energy to light a 60-watt light bulb for up to six hours.
- Producing new plastic products from recycled materials uses approx. 67% less energy than required to make products from raw (virgin) materials.
- It takes approx. 2,000 times more energy to produce bottled water than tap water.

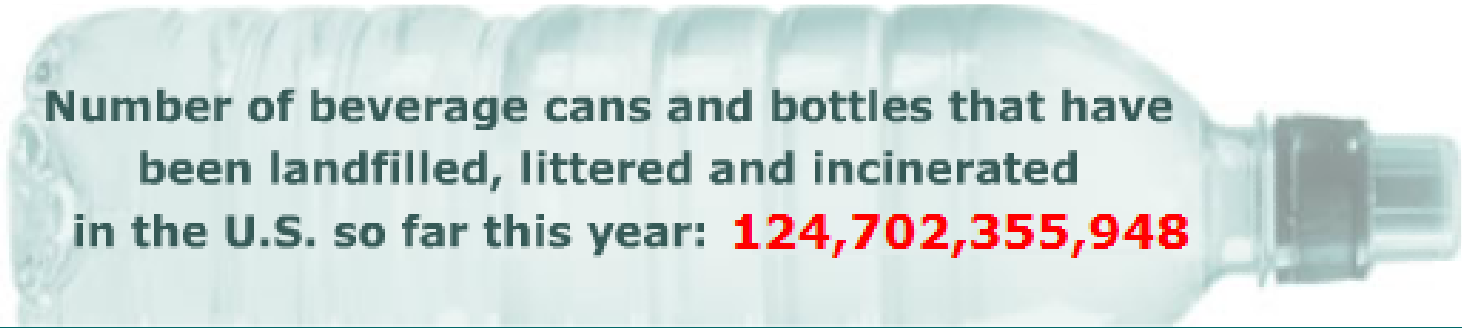
*Sources: Container Recycling Institute, International Bottled Water Association, Environmental Working Group, The Economist, others.*



# Why should we care?

(cont'd.)

**CRI**  
CONTAINER  
RECYCLING  
INSTITUTE



Number of beverage cans and bottles that have  
been landfilled, littered and incinerated  
in the U.S. so far this year: **124,702,355,948**

As of 19-Dec-2011 @ 16:45 (local U.A.E. time)

... that's more than ***350 Million*** containers a day !!!



**That's a lot of plastic !! ... & that's just the U.S.**



## *But isn't that in America...* **Why should we care?**

A very large proportion of the bottled drinking water used in homes and offices in the U.A.E. is supplied in re-usable hard plastic bottles made from Polycarbonate (PCB), also known as Lexan.<sup>®</sup>

There are health and hygiene factors or risks associated in particular with the use of the ubiquitous free-standing water coolers with the 5-gallon bottles:

- The leaching of *Bisphenol A* (BPA) has been linked to certain ailments or potential health risks – refer to the Harvard School of Public Health press release of May 2009. [[Link](#)]
- Plus, there are other health / hygiene risks associated with regular handling and replacing the bottles, possible contamination, etc.



# *No, but really...* **Why should we care?**

- A picture tells a thousand words:



- In terms of time, space, and convenience, it is also worth considering the regular deliveries of bottles and the associated hassles of transporting/storing them at your home or place of work – office, bank, school, clinic, etc.
- Don't forget that each time you replace a bottle, lifting the 20-kg. full bottle poses or increases the risk of developing or aggravating back pain.



# But... is there an alternative?

I believe there's more than one...

- Use ***bottle-free*** dispensers... there are some on the market (air-to-water, home filtration units, etc.)
- Produce / treat your own drinking water \*
- When you do buy bottled water:
  - ✓ Always choose local water from the closest source... saves a lot of fuel (and usually saves you money)
  - ✓ Choose PET over PCB when available
  - ✓ And of course... *Re-use & Recycle* the empty bottles
- Spread the word !!! [ [Know your plastics](#) ]

\* Please don't drink directly from the tap or well unless the water has been tested / checked to be free of contaminants & harmful substances with lab analysis confirming that it is fit for drinking.



# **Closing remarks & your questions / comments**



# About DEWS

- **Dynamic Energy & Water Solutions (DEWS)** is a licensed *Enpark Free Zone* company based in Dubai.
- We are a future-looking company that has the will and desire to advance the use of solar energy and water purification / recycling, not only because they are essential ingredients of a *Greener*, more sustainable environment, but also out of conviction that they can provide all participants with better living conditions and meaningful work in the process.
- Our unique value proposition is providing products, turn-key solutions and other services to *underserved niches with special needs* – new solar and renewable energy technology / applications, solar to water, solar cooling, water purification, re-use & recycling, drinking water dispensers, equipment sale & rental / leasing, project advisory services & execution support.
- DEWS caters to the needs of a number of target market segments in the Middle East & North Africa, offering innovative products & services to a variety of sectors, including commercial, residential, industrial, utilities, marine, oil & gas.
- DEWS markets and sells technology-based products of high quality and unique function or features supplied by reputable vendors / manufacturers.

***Making a difference and feeling  
good about it...***



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# Appendix 1



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## Press Releases

### *2009 Releases*

## BPA, Chemical Used to Make Plastics, Found to Leach from Polycarbonate Drinking Bottles Into Humans

*Exposure to BPA May Have Harmful Health Effects*

For immediate release: Thursday, May 21, 2009

Boston, MA -- A new study from Harvard School of Public Health (HSPH) researchers found that participants who drank for a week from polycarbonate bottles, the popular, hard-plastic drinking bottles and baby bottles, showed a two-thirds increase in their urine of the chemical bisphenol A (BPA). Exposure to BPA, used in the manufacture of polycarbonate and other plastics, has been shown to interfere with reproductive development in animals and has been linked with cardiovascular disease and diabetes in humans. The study is the first to show that drinking from polycarbonate bottles increased the level of urinary BPA, and thus suggests that drinking containers made with BPA release the chemical into the liquid that people drink in sufficient amounts to increase the level of BPA excreted in human urine.

The study appears on the website of the journal *Environmental Health Perspectives* and is freely available at <http://www.ehponline.org/members/2009/0900604/0900604.pdf>.

In addition to polycarbonate bottles, which are refillable and a popular container among students, campers and others and are also used as baby bottles, BPA is also found in dentistry composites and sealants and in the lining of aluminum food and beverage cans. (In bottles, polycarbonate can be identified by the recycling number 7.) Numerous studies have shown that it acts as an endocrine-





# Appendix 2

## Recycling Plastic Bottles

There are three types of recyclable plastic bottles. They are all recycled separately:

### PET Bottles



PET bottles have this symbol on the side or on the bottom:

### HDPE Bottles



HDPE bottles have this symbol:

### PVC Bottles



PVC bottles have this symbol:










Sources: Ollie Recycles [www.oliirecycles.com/uk](http://www.oliirecycles.com/uk) [www.recyclelogos.org/](http://www.recyclelogos.org/)



# Appendix 2

## Plastic Types & Recycling Codes

 <b>PETE</b>	<b>Polyethylene Terephthalate Ethylene</b>  PETE goes into soft drink, juice, water, detergent, and cleaner bottles. Also used for cooking and peanut butter jars.	 <b>PP</b>	<b>Polypropylene</b>  PP goes into caps, disks, syrup bottles, yogurt tubs, straws, and film packaging.
 <b>HDPE</b>	<b>High Density Polyethylene</b>  High Density Polyethylene HDPE goes into milk and water jugs, bleach bottles, detergent bottles, shampoo bottles, plastic bags and grocery sacks, motor oil bottles, household cleaners, and butter tubs.	 <b>PS</b>	<b>Polystyrene</b>  PS goes into meat trays, egg cartons, plates, cutlery, carry-out containers, and clear trays.
 <b>PVC</b>	<b>Polyvinyl Chloride</b>  PVC goes into window cleaner, cooking oils, and detergent bottles. Also used for peanut butter jars and water jugs.	 <b>OTHER</b>	<b>Other</b>  Includes resins not mentioned above or combinations of plastics.
 <b>LDPE</b>	<b>Low Density Polyethylene</b>  LDPE goes into plastic bags and grocery sacks, dry cleaning bags, flexible film packaging, and some bottles.		





# Appendix 3

GLOBAL BOTTLED WATER MARKET Per Capita Consumption by Leading Countries 2004 – 2009			
2009		Gallons Per Capita	
Rank	Countries	2004	2009
1	Mexico	44.5	61.9
2	Italy	48.5	50.7
3	United Arab Emirates	27.9	40.1
4	Belgium-Luxembourg	39.1	36.7
5	Germany	33.0	34.5
6	France	37.4	33.8
7	Lebanon	26.8	31.8
8	Spain	36.1	31.4
9	Hungary	20.1	29.3
10	United States	23.2	27.6
11	Slovenia	21.2	27.1
12	Thailand	20.2	26.4
13	Saudi Arabia	23.2	26.4
14	Switzerland	26.3	26.0
15	Croatia	18.1	25.6
16	Qatar	20.6	25.5
17	Cyprus	24.3	24.5
18	Austria	21.7	23.5
19	Czech Republic	23.0	23.3
20	Hong Kong	15.4	21.9
	<b>GLOBAL AVERAGE</b>	<b>6.4</b>	<b>7.9</b>

*Source: Beverage Marketing Corporation*

