



# CASE STUDY

## SUSTAINABILITY

### PACXPERT™ PACKAGING TECHNOLOGY ENABLES SUSTAINABILITY ADVANTAGES IN DELIVERING FRESH WATER FOR DISASTER RELIEF EFFORTS

An environmental impact study prepared by the Institute for Environmental Research and Education (IERE) compared flexible *CubePak* containers made with Dow's PacXpert™ Packaging Technology to one-gallon rigid plastic water bottles and cases of single-use plastic water bottles in a series of theoretical scenarios in which drinking water was supplied to a disaster zone.

The study considered transportation of packaging, water, and water treatment resources in terms of fuel used in transport, CO<sub>2e</sub> expelled during transport, and other environmental considerations. As demonstrated in the data here, the *CubePak* containers made with PacXpert™ Packaging Technology proved a more sustainable option across every scenario.



### TRUCKLOADS NEEDED TO SUPPLY DRINKING WATER

#### SHIPPING INFORMATION

SHIPPING INFORMATION	NUMBER OF TRUCKLOADS NEEDED FOR ONE WEEK	NUMBER OF TRUCKLOADS NEEDED FOR ONE DAY
Bottles of water	7.7	1.1
One-gallon rigid containers	2.2	2.2
One-gallon <i>CubePak</i> containers	0.1	0.1
Water purifier (for use with on-site water supply)	0.1	0.1
Water tanker (4,800-gallon tanker for daily clean water)	7	1

**EMPTY VS. EMPTY WITH ON-SITE FILTERED WATER SOURCE:**

**22x** MORE FUEL

TO TRANSPORT RECTANGULAR ONE-GALLON RIGID CONTAINERS THAN TO TRANSPORT THE CUBEPAK ONE-GALLON CONTAINERS.

**2.2 TRUCKLOADS** OF EMPTY RIGID CONTAINERS



**0.1 TRUCKLOAD** TO SHIP EMPTY CUBEPAK CONTAINERS

**SAVINGS OF**

**5 TONNES** OF CO<sub>2e</sub>



COMPARABLE TO DRIVING A CAR ~12,000 miles

**OR** ELECTRICITY FOR ONE HOUSE FOR 250 DAYS!



In disaster relief, efficient logistics are critical. *CubePak* containers using PacXpert™ Technology can help deliver a week's worth of drinking water in just 1/10 of a truck's space, leaving 90% of the cargo space for other desperately needed supplies or equipment. Plus, getting more than seven trucks (see below) into a disaster area could be problematic, making one truck preferred.

**FULL VS. EMPTY WITH ON-SITE FILTRATION SYSTEM**  
(one week scenario)

**7.7 TRUCKLOADS** (11,200 CASES) OF BOTTLED WATER



**VS. 1**

**0.1 TRUCKLOAD** OF EMPTY ONE-GALLON CUBEPAK CONTAINERS (FOR ONE WEEK)

Each scenario was based on 4,800 people needing one gallon of drinking water daily (either for one week, assuming re-use of containers; or for one day, assuming no container reuse). All equipment and supplies were assumed to be trucked in from 500 miles away, returning empty.

# CASE STUDY SUSTAINABILITY

While direct comparisons between scenarios may not be precise, a number of conclusions attesting to the benefits of PacXpert™ Packaging Technology can be easily drawn:

- The lowest fuel use and environmental impact due to transportation is provided by the combination of on-site treatment and the use of reusable *CubePak* containers.
- The environmental impact of transporting one-gallon *CubePak* containers is approximately 20X lower than the transport of other one-gallon containers.
- Depending on the assumptions made, transporting *CubePak* containers uses 20 to 40 times less diesel than transporting conventional one-gallon rigid rectangular containers or the bottled cases of water.
- In one-day scenarios, the use of bottled water had 5.5 times more transportation impact than the use of on-site treatment using *CubePak* containers. In one-week scenarios, the impact is 60 times.

Beyond these hypothetical situations, the sustainability benefits of using PacXpert™ Packaging Technology are already being realized in real-world applications around the globe. Contact a Dow representative to learn more about this exciting innovation and how to make PacXpert™ Packaging Technology a part of your packaging strategy.

## SCENARIOS

### Scenario 1: Bottled Water For One Day

Water is supplied through bottled water: half-liter (16.8 oz) rigid containers; eight bottles per person; 24 bottles to the case; 1,600 cases needed for the day

### Scenario 2: Tanker With Single-Use Containers For One Day

Water is distributed from a water tanker holding 4,800 gallons of potable water to either:

- 4,800 rectangular one gallon rigid containers (assumes single use)
- 4,800 *CubePak* one gallon containers (assumes single use)

### Scenario 3: On-Site Water Treatment For One Day

Water is supplied through an on-site treatment system that is trucked to the site. Local contaminated water is treated to safe standards and distributed to either:

- 4,800 rectangular one gallon rigid containers (assumes single use)
- 4,800 *CubePak* one gallon containers (assumes single use)

### Scenario 4: Bottled Water For One Week

Water is supplied through bottled water: half-liter (16.8 oz) containers, eight bottles per day per person; 24 bottles to the case; 11,200 cases needed for the week

### Scenario 5: Tanker With Reusable Containers For One Week

Water is distributed from a water tanker holding 4,800 gallons of potable water to either:

- 4,800 rectangular one gallon rigid containers (assumes daily reuse)
- 4,800 *CubePak* one gallon containers (assumes daily reuse)

### Scenario 6: Onsite Water Treatment

Water is supplied through an on-site treatment system that is trucked to the site. Local contaminated water is treated to safe standards and distributed to either:

- 4,800 rectangular one gallon rigid containers (assumes daily reuse)
- 4,800 *CubePak* one gallon containers (assumes daily reuse)

Each scenario was based on 4,800 people needing one gallon of drinking water daily (either for one week, assuming re-use of containers; or for one day, assuming no container reuse). All equipment and supplies were assumed to be trucked in from 500 miles away, returning empty.

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