



Meeting Review

November 20, 2014

Overview

On November 20, 2014, United Technologies and Carrier convened the inaugural World Cold Chain Summit to Reduce Food Waste at the InterContinental London Park Lane, bringing together 65 economists, engineers, journalists and players in the cold chain industry from 12 countries to engage in a spirited discussion of strategies for preventing food loss and waste.

The Summit opened a dialogue on significant global food waste challenges. One in eight people on earth goes to bed hungry each day while 2.5 billion suffer from some form of nutritional deficiency. Meanwhile, one third or more of all food produced never makes it to a consumer. As the earth's population approaches 9 billion people in 2050--two thirds of which will live in urban areas away from the source of food supply--the solution of simply "growing more" needs to be challenged.

Opening Keynote Remarks

David Appel, president, Carrier Transicold & Refrigeration Systems, welcomed participants, reminding them that United Technologies' Carrier and Otis brands have played important roles in the urbanization of the world, and since the 1930s Carrier has been a major player in both air conditioning and the cold chain. "We take seriously our responsibility to deliver refrigerated products safely," Appel told the audience, "and we want to play a leading role in bringing about quantifiable reductions in food loss and waste."

John Mandyck, chief sustainability officer, UTC Building and Industrial Systems, reminded attendees that "we are absolutely at an inflection point with

food, one of the most critical resources for the human race." Farming is the largest human endeavor on earth, Mandyck continued, using 38 percent of our ice-free land, 70 percent of all fresh water, and creating 14 percent of the world's greenhouse gas emissions. The embodied carbon dioxide of food waste, including fuel and power used to grow and package, amounts to 3.3 billion metric tons annually, which if it were a country, would be third only to China and the United States as an emitter of greenhouse gas. Remembering that total food loss and waste can approach 40 percent, he said, "It is hard to imagine such an inefficient system for such an essential resource."

Mandyck highlighted to Summit participants that 37 percent of food waste occurs at the consumer level while 63 percent occurs at some stage of production, transportation, storage or in the marketplace. "Solutions to this global problem begin with the need for a global dialogue," he said. "This event is designed to begin that dialogue."

The morning's keynote speaker was Philippe Cousteau, son of Philippe Cousteau Sr. and grandson of Jacques Cousteau. He is an author, speaker, philanthropist, world traveler, social entrepreneur and award-winning television host with CNN.

Cousteau's central thesis was that "the ocean is an essential hub that connects each and every one of us." It provides half the world's oxygen as well as food, protection from storms, regulation of our environment and--when healthy--a strong economy. "A healthy ocean," Cousteau said, "makes life on earth possible and can play a fundamental role in solving the problem of world hunger."

Just imagine, he challenged participants, that by fixing unproductive fishing practices and reducing ocean waste we could create protein for a billion people while improving the world economy. Land-based sources of animal protein can be six to eight times less efficient than harvesting ocean protein, Cousteau said. Meanwhile, scientists estimate up to one third of the carbon we emit is absorbed by the ocean; acidic seawater makes it difficult for creatures like crabs, coral, and plankton to live and reproduce. In the Pacific Northwest alone, he added, today acidification is killing billions of sea creatures and costing billions of dollars.

“The oceans are a proxy for the problems we are trying to solve,” Cousteau concluded. “The journey we are on together and the way we relate and react to world resources mirrors the journey of my father and grandfather—which began as exploration but became the story of how we are connected to the world.”

Morning Panel Discussions

The Summit’s first panel discussion, focusing on developing economies, included co-moderator Dr. Tim Fox, head of energy and environment, Institution of Mechanical Engineers; co-moderator Jeremy Lovell, a freelance journalist specializing in energy and climate change issues; Dr. Lisa Kitinoja, owner of Extension Systems International and a specialist in postharvest technology; Dr. Leon A. Terry, director of agrifood at Cranfield University; and Wyn Morgan, professor of economics in the School of Economics and assistant pro-vice chancellor for teaching and learning, both at the University of Nottingham.

Key conclusions from the panel included the following:

- The defining challenge of the 21st century is how to deliver food security in a sustainable way to a growing planet. This has led to a focus on the resources used, and challenged the mantra that the solution to feeding the world’s population is to expand production.
- “The threat to perishable products is warmth,” Dr. Fox said. There are many other technologies that may come into play to help expand and improve the cold chain. However, “cold” is the basis of postharvest; without it, we are in an uphill struggle. The fundamental equation is that “we need to deliver cold in a sustainable way to reduce that threat.”
- Human capital is critical. “There are probably 400 postharvest scientists around the world who are active in researching, training people and publishing,” Dr. Terry said. There is not nearly enough talent working on these issues. “It’s about human capital, and connecting human capital to technology.”
- Dr. Kitinoja concurred, saying that education and knowledge transferred to local economies can create a ripple effect, leading to significant long-term change. “It’s not just about how we use technology, but we must have people on the ground and at the university level to tackle this major problem.” There is a perception that the cold chain is too expensive and complicated in developing economies. But investment in

the cold chain—customized cooling of all kinds, in all markets—turns out to be one of the single best investments in food preservation.

- Economist Wyn Morgan reminded the group that “very cheap food leads to many consequences—we don’t value it as we should.” Governments need to be involved in the dialogue around food waste and loss so that their actions benefit consumers and support good cold chain practices.
- Jeremy Lovell echoed this, saying that “the public needs to be involved-- governments respond to their electorate. Too many people in the developing world are ‘off the screen.’” In particular, power and transport infrastructure needs to be built hand-in-hand so that the cold chain can become a reality in developing countries.
- Financing and new business models can be as important as technology is in solving cold chain issues for developing countries.
- A global plan is daunting, but embedding new models and technologies in particular niches has led to improvements in a number of markets. Find small successes that can be built upon.

The panel concluded with the understanding that empowering the local community is critical. There is a fundamental desire around the world to engage in the issue of food waste and loss, which can be tackled locally and directly in ways that broader climate change cannot.

Afternoon Keynote Remarks

The afternoon’s keynote speaker was Barton Seaver, a chef, Explorer with the National Geographic Society, and leader of the Healthy and Sustainable Food Program at the Center for Health and the Global Environment at the Harvard School of Public Health. Seaver brought a human, more emotional element to the day’s conversation, saying that “food is the way we explore our world.” He presented a short video that showed how the use of leftover and wasted food could “not only feed the soup line, but shorten it by providing new economic opportunity.” Chefs can be catalysts for change in a community, he added, because they can “feed the soul of a city.”

Seaver is focused on sustainable food systems and the people behind them, with a special emphasis on the oceans. “For too long we’ve told the oceans what we want versus what they can give us.” Only 2 percent of our food comes from the ocean, he said, which represents 80 percent of the biomass of the planet. And, 80 percent of the wild catch in the ocean is captured by 20 percent of the global fleet, creating an important distinction between “the catching industry” and “the fishing industry.” Fish farming is a major opportunity, Seaver said. The amount of food that can be grown in the ocean is infinitely greater than on land, and can be produced more efficiently.

Seaver concluded his presentation by reminding his audience, “When you make food more secure you make people more secure.”

Afternoon Panel Discussions

Andrew Morgan from Global 78 Ltd., a company that maps and improves global food supply chains, moderated the afternoon panel with Wyn Morgan and Charlie Winkworth-Smith from the University of Nottingham, a global academic institution heavily invested in food security issues. Morgan and Winkworth-Smith presented research underwritten by Carrier investigating the perishables supply chain across global regions in both developed and less developed countries, including respondents in government, academic, NGO and private industry. Their work was intended to be the start of a long-term program that will lead to action that can make a difference.

Three basic questions were addressed:

- What are the causes of food loss?
- How can it be reduced?
- What data is required for further action?

Key findings included the following:

- The cold chain is not the only cause of food loss, but it is seen as the primary cause. Other factors include lack of infrastructure (e.g., roads, energy), lack of cold storage (between farmer and retail), poor harvesting practices, quality of supply chain management and government policy. In one example, they noted, 97 percent of the meat in Tanzania never sees a refrigerator.
- Reduction of food loss can come about through good road infrastructure, a reliable supply of electricity, better packaging,

investment in cold chain (e.g., farm storage, pre-cooling options, reefers, marketplace storage), reduction in the length of time spent in the cold chain, access to credit, edible coatings, education and training.

- The panel noted that 2.5 billion people suffer from some form of nutritional deficiency. The cold chain provides hope, however: preliminary results suggest that through the application of cold chain technology in India, food loss can be reduced by 30-35 percent, which might reduce the number of undernourished people in India by approximately 35-50 million. Similar stories can be told in China, Uganda and other countries.
- There is considerable data still required to build a complete picture of cold chain opportunities. This includes more precise information on how much food loss there truly is, and how to value it (e.g., weight, kcal, cost, micronutrients); improved geographic information; better measurement of the impact on rural income; information on how harvest practices can be improved; an inventory of old storage assets with cost and benefit; and a better understanding of transportation costs, time through cold chain and associated product loss.

The University of Nottingham study concluded that food loss could be reduced by improving infrastructure and implementing a cold chain in emerging markets. Better education and the ability to customize solutions will be critical to meet the demands of individual markets. And, a rapidly

growing middle class in countries like China will change the way consumers shop, from local convenience shops to supermarkets.

The day's final panel, which focused on food loss and waste in developed markets, included Joan Rosen of JC Rosen Resources, a consulting firm with global expertise in cold chain management; Steven Finn, managing director of ResponsEcology, a sustainability and change management consulting firm; and moderator Jeremy Davies, director of the Corporate Services Division at Campden BRI. Finn began by saying that food waste in the developed world is all too easy to find. "It's a huge problem requiring a global network to have an impact," he said. "Social innovation, incentives and showing business that there is competitive advantage are all important."

Joan Rosen related a story from 20 years ago, probably still true today, of being shown a dumpster by a retailer who indicated "this is my largest customer. The amount of food that is diverted on production lines for cosmetic and other reasons is staggering," she added. The panel also shared examples of successful food waste initiatives, which generally involve close collaboration among many players, improved processes and hands-on training.

The barriers to change are significant and include fear of liability (donation partnerships might create legal issues or hurt reputation), lack of transportation infrastructure, fear of reliability (lean organizations are fixated on cheap landfills) and fear of added cost.

The panel concluded by agreeing that increased data and regulation will help drive standards and improvements in cold chain practices throughout mature cold chains.

Conclusion

Finally, John Mandyck returned to the podium to thank National Geographic for its support, and for being at the forefront of telling the story of food waste and loss. He summarized important lessons from the Summit, saying, "Our goal today was to elevate this discussion. I think you'll agree we've done that together." He then challenged participants to use this platform as a way to connect with others, so that the issues of hunger, climate protection and food loss and waste are understood as interdependent.

"We can meet the needs of a growing planet," he said. "Waste less, feed more, with measurable and tangible benefits to the environment."