



## Aviation's Path to Zero Waste

By William F. Tarantino

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The International Air Transport Association (IATA) defines “cabin waste” as all waste generated within an aircraft cabin.<sup>1</sup> Cabin waste includes cleaning and lavatory waste and the items brought aboard by passengers, as well as the airline’s catering waste, such as plastic cups, napkins, cans, and juice boxes.<sup>2</sup> In 2016, 5.2 million metric tons of cabin waste were generated.<sup>3</sup> In 2017, that number jumped to 5.7 million metric tons, costing the airline industry \$927 million.<sup>4</sup>

Concerns about cabin waste have existed for decades, but most airlines and catering companies have recycled very little.<sup>5</sup> An estimated 75 percent of cabin waste is recyclable,<sup>6</sup> but only 20 percent is recycled annually.<sup>7</sup> Instead, most is disposed of by incineration, landfill burial, pressure sterilization, or autoclaving, or it is ground into an approved sewage system.<sup>8</sup>

The corporate costs—both actual and reputational—of unsustainable waste practices are escalating,<sup>9</sup> and those costs are likely to increase as long as consumers’ concerns about sustainability rise. According to a survey published by IBM’s Institute for Business Value, consumers’ attitudes toward sustainability across the globe reached a “tipping point” in 2020.<sup>10</sup> Of the 18,980 consumers surveyed, 80 percent of respondents indicated that sustainability is

important for them, and nearly 60 percent said that they are willing to change their shopping habits to reduce their personal environmental impact.<sup>11</sup>

With sustainability trending, the aviation industry may capitalize on a growing body of research that indicates that it is possible for airlines to reduce and reuse a larger portion of cabin waste at a cost savings.<sup>12</sup> A few leading airlines and catering vendors globally are already rethinking their cabin waste management systems. Their actions illustrate the business opportunity offered to airlines and related cabin services stakeholders—such as caterers, ground handlers, airports, and recyclers—with regard to thinking and acting sustainably.

This article provides an analysis of air travel’s waste problem and the various efforts across the industry that promise a pathway toward a more sustainable future—all while expected passenger growth climbs approximately 7 percent per year through at least 2030.<sup>13</sup>

### The Waste Problem

Excessive cabin waste has been attributed partially to stringent policies that govern its disposal, which are frequently a barrier to sustainable waste management.<sup>14</sup> Most jurisdictions have legislation that ensures that cabin waste is properly handled, stored, and disposed of. However, particularly in jurisdictions with agricultural sectors to protect, cabin waste is handled differently depending on whether the waste is generated domestically or internationally: international waste often cannot be recycled or reused.<sup>15</sup> These

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jurisdictions, which include Australia, the United States, and the European Union, have imposed restrictions on how animal-derived food waste generated on international flights—herein, international catering waste (ICW)—may be disposed of to limit the risk of agricultural contamination.<sup>16</sup>

ICW tends to be disposable via incineration, deep landfill burial, pressure sterilization, autoclaving, or grinding into an approved sewage system.<sup>17</sup> Enforcement is “robust,”<sup>18</sup> and fears of ICW intermingling with otherwise nonregulated waste has caused airlines and airports that collect and sort waste to be overinclusive in their treatment of potentially harmful cabin waste;<sup>19</sup> IATA research indicates that untouched food and beverages account for over 20 percent of cabin waste.<sup>20</sup>

Stringent ICW policies are abundant. The U.S. Department of Agriculture defines “cabin waste” as waste material derived partially or entirely from not only meats and animal products but also fruits and vegetables,<sup>21</sup> though it is understood that the potential for plant disease outbreaks from meals served on airlines is “negligible.”<sup>22</sup> Most other jurisdictions regulate only meat-derived waste accordingly.<sup>23</sup> ICW in the United States is to be incinerated, sterilized, or ground, with an exception for waste that originates from Canada.<sup>24</sup> On the other hand, the Canadian Food Inspection Agency’s (CFIA’s) definition of “international catering waste” is limited to waste containing or suspected of containing animal products or by-products, but waste originating from the United States is not excepted, so all international waste in Canada is subject to disposal requirements that similarly hinder recycling or reuse.<sup>25</sup>

The European Union (EU) regulates cabin waste into two categories: Category 3 (Cat. 3) refers to the category of waste from animal by-products and animal-derived products originating from inside the EU, whereas Category 1 (Cat. 1) refers to the same waste flying in from outside of the EU.<sup>26</sup> EU-originating Cat. 3 waste is comprised of two “mixes”: (1) one containing inorganic recoverables, like plastics and cans; and (2) one containing organic wastes and other waste that flight crews are unable to separate, like napkins.<sup>27</sup> These mixes, called “fractions,” are consolidated in one bag and accumulate in containers that are sent to sorting plants.<sup>28</sup> Cat. 1 waste is considered a “high-risk waste fraction” due to its origin, so it is subject to “much stricter” regulation.<sup>29</sup> In practice, this means that the cabin waste generated by flights from outside of the EU is collected by the same waste management

company that collects Cat. 3 waste, but Cat. 1 waste is instead deposited directly into an authorized landfill, so the waste cannot be recycled.<sup>30</sup>

Addressing excess cabin waste does not start or stop with regulatory action. Airlines have also independently struggled to implement cabin waste reuse and recycling programs. IATA attributes this struggle to the “challenging” nature of flight operations, which includes short turnaround times and a lack of cabin space, as well as hidden costs associated with current waste management practices that give disposal the appearance of being cheaper.<sup>31</sup> Waste’s hidden costs also explain why airlines and catering contractors continue to use materials that are costly and wasteful, even where opportunities to alternate, reduce, or prevent waste generation exist.<sup>32</sup>

In 2010, Green America released a study on airline waste, finding that no airline had a comprehensive program for minimizing waste onboard.<sup>33</sup> Since then, many airlines have implemented comprehensive sustainability programs, but airlines still may struggle to minimize waste because many jurisdictions lack robust recycling systems.<sup>34</sup> Jurisdictions and airports without robust recycling systems make it difficult for flights off-loading waste to reuse or recycle their waste because there exists no mechanism to sustainably and safely manage cabin waste; the waste “all goes into the same place” regardless.<sup>35</sup> The regulatory and practical realities that have contributed to airlines’ current cabin waste problem have meant that incineration and landfill burial disposal maintain economies of scale, and some airports do not allocate any resources to recycling non-ICW waste.<sup>36</sup>

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## Pathways to Sustainability

Given all the challenges that contribute to cabin waste, a number of actors have begun thinking and acting sustainably, and their efforts show how all airline waste stakeholders can take measures to prevent, reduce, and reuse cabin waste.

### “Closed-Loop” Opportunities

A closed-loop or circular economy prevents waste by

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reusing raw materials whenever possible,<sup>37</sup> maximizing waste recycling and recovery. As it currently stands, most ICW is generated primarily within a linear economy, meaning that the raw materials that ultimately result in cabin waste are disposed of after use.<sup>38</sup>

Cathay Pacific Airlines offers an example of what sustainable cabin waste management can look like with its triangulated sustainability efforts exploring “closed-loop” opportunities.<sup>39</sup> To “close” its waste loop, the airline’s catering services division, Cathay Pacific Catering Services, which handles the catering requirements of more than 45 airlines that operate at Hong Kong International Airport, has diverted waste, donating over 156,000 preprepared meals to its Hong Kong-based nongovernmental organization

partner Food Angel as part of the airline’s redistribution initiative.<sup>40</sup> In 2020, the airline announced a target to reduce its single-use plastic footprint by 50 percent by the end of 2022 by exploring alternative packaging materials such as birchwood stirrers and paper straws.<sup>41</sup> Additionally, the napkins distributed to passengers are made from sustainable 70-percent sugarcane and 30-percent wood pulp.<sup>42</sup>

However, Cathay Pacific recycles *only* on inbound flights to Hong Kong, citing “very strict health and safety regulations” regarding the

way that airlines must treat waste in other jurisdictions such as Australia and Canada.<sup>43</sup>

#### *Budget Airlines’ Practices*

Low-cost airlines also offer examples of effective, if not accidental, sustainable waste management.<sup>44</sup> Many airlines provide a default cabin service where passengers receive a “parade” of packaged, single-use selections of consumables included in their fare.<sup>45</sup> On the other hand, budget airlines, like Ireland’s “ultra-low-cost carrier” airline Ryanair, tend to implement a pay-as-you-go approach to their cabin services, where travelers purchase all snacks and beverages before or during a flight, reducing the amount of untouched food that is discarded, as passengers will presumptively only purchase what they consume.<sup>46</sup> Going a step further, in recognition of the “parade” of single-use packaging, Ryanair announced plans to be plastic-free by 2023 as the airline works with suppliers to replace nonrecyclable plastics with environmentally friendly alternatives such as biodegradable cups, wooden cutlery, and paper packaging.<sup>47</sup>

#### *Other Airlines’ Initiatives*

Other airlines have likewise developed cabin waste objectives, targets, and pledges that prevent, reuse, and recycle cabin waste.<sup>48</sup> In 2020, British Airways increased its target for removing single-use plastic from its flights to more than 700 metric tons, a 700-percent target increase.<sup>49</sup> The airline hit its previous target of removing 90 metric tons of single-use plastic annually by swapping plastic stirrers with bamboo alternatives, reducing plastic packaging on amenity kits, swapping plastic bedding and blanket wrapping with paper alternatives, and removing in-flight retail plastic bags.<sup>50</sup>

Etihad Airways and Cathay Pacific have turned to passenger data, tracking preferences and consumption patterns to adjust which meals are produced or loaded onto flights to reduce food waste.<sup>51</sup> Similarly, Japan Airlines allows passengers to opt out of meals before flights to reduce excessive waste.<sup>52</sup> And Alaska Airlines’s “#FillBeforeYouFly” campaign rallied fliers to bring their own water bottles and fill them before they board as part of the airline’s overall goal to reduce the use of single-use plastics in flight.<sup>53</sup>

#### *Individual and Business Efforts*

Finally, individual travelers as well as businesses purchasing travel for employees can also play a role in reducing cabin waste by selecting or partnering with airlines that have sustainable cabin waste programs, by bringing or requiring employees to bring reusable containers for items consumed aboard, or by rejecting items that will not be consumed or used during flight.

#### *Implementation of Industry Research Projects*

Research projects such as Iberia’s Zero Waste Project or IATA’s Cabin Waste Handbook have comprehensively assessed cabin waste and identified actions all stakeholders—individuals, airlines, airports, and catering services alike—may take to reduce cabin waste. The Zero Waste Project’s 40-month analysis and strategy implementation reduced waste per passenger by 12 percent and the amount of waste sent to landfills by more than two metric tons.<sup>54</sup> IATA’s subsequent research on cabin waste yielded recommendations spanning 101 pages in its 2019 handbook on cabin waste, underscoring the breadth of sustainable opportunities for the aviation industry.<sup>55</sup>

#### **Conclusion**

Despite positive steps toward sustainable cabin waste management in the decade since Green America’s study in 2010, airline cabin waste volumes have only grown alongside consumer sustainability concerns. With consumer concerns about the sustainability of flying at an all-time high, actions taken by airlines to “green” their fleets and operations will come under increasing scrutiny by potential travelers, especially on

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visible and practical aspects of the flying experience, such as the diversion and recycling of cabin waste.

Leading airlines will not only achieve green operations through changes to their waste management practices but also are likely to engage with national and local regulators to secure safe and productive legislative changes to cabin waste management. Further action by the aviation industry may see airlines and airports demanding more diversion opportunities from local supply chains and waste management entities.

Without a doubt, airlines and other cabin services stakeholders looking to capitalize on the related opportunities to capture environmentally conscious flyers are likely to continue to be creative, collaborative, and innovative in developing operational, local, and regulatory means to green operations.

## Endnotes

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