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Theme - The Peel-to-Cup Orange Juice Bar

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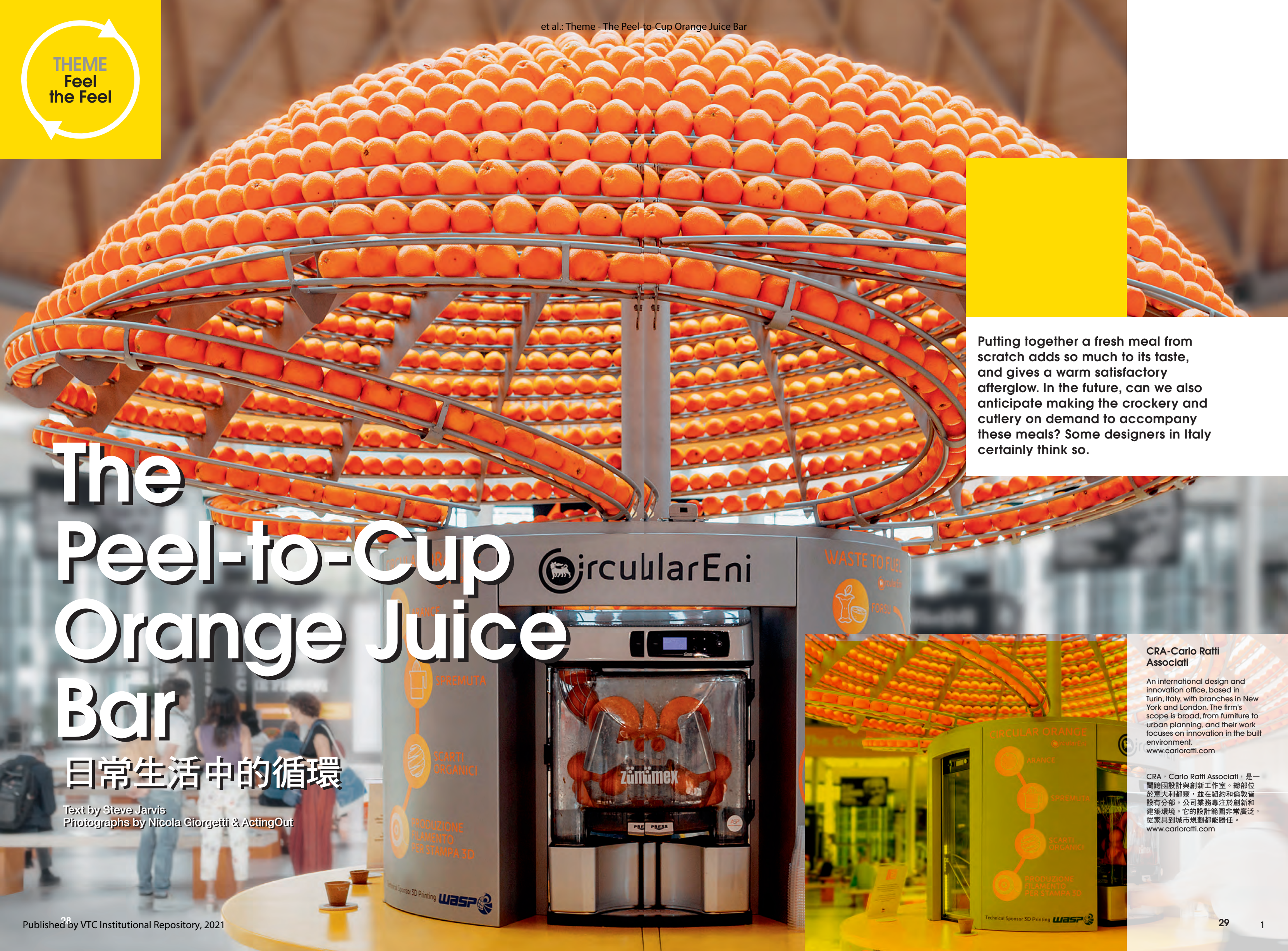
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The Peel-to-Cup Orange Juice Bar

日常生活中的循環

Text by Steve Jarvis
Photographs by Nicola Giorgetti & ActingOut



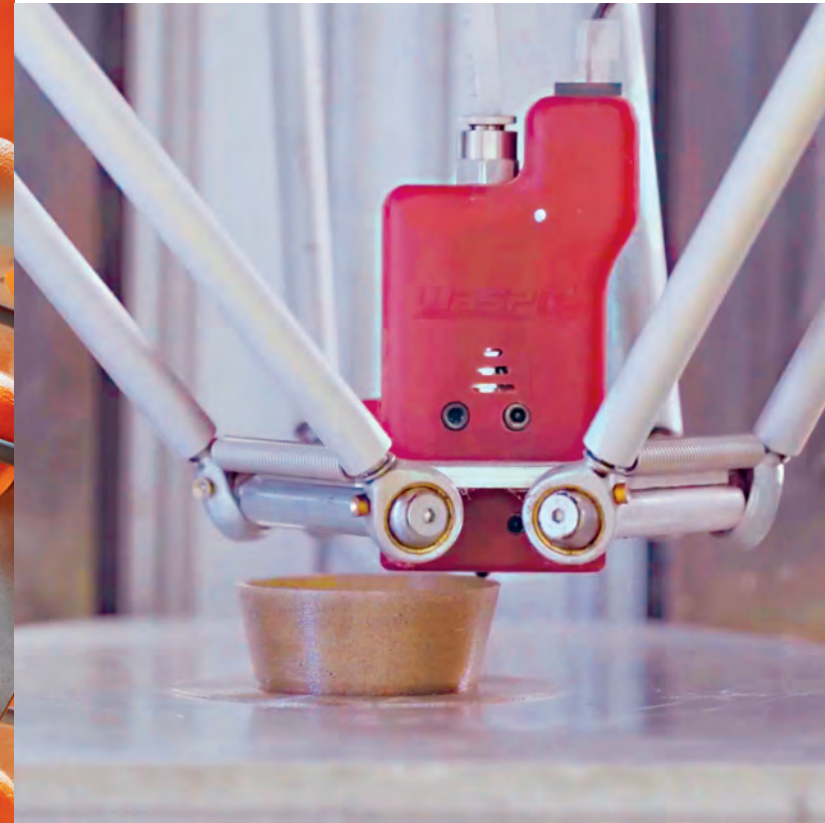
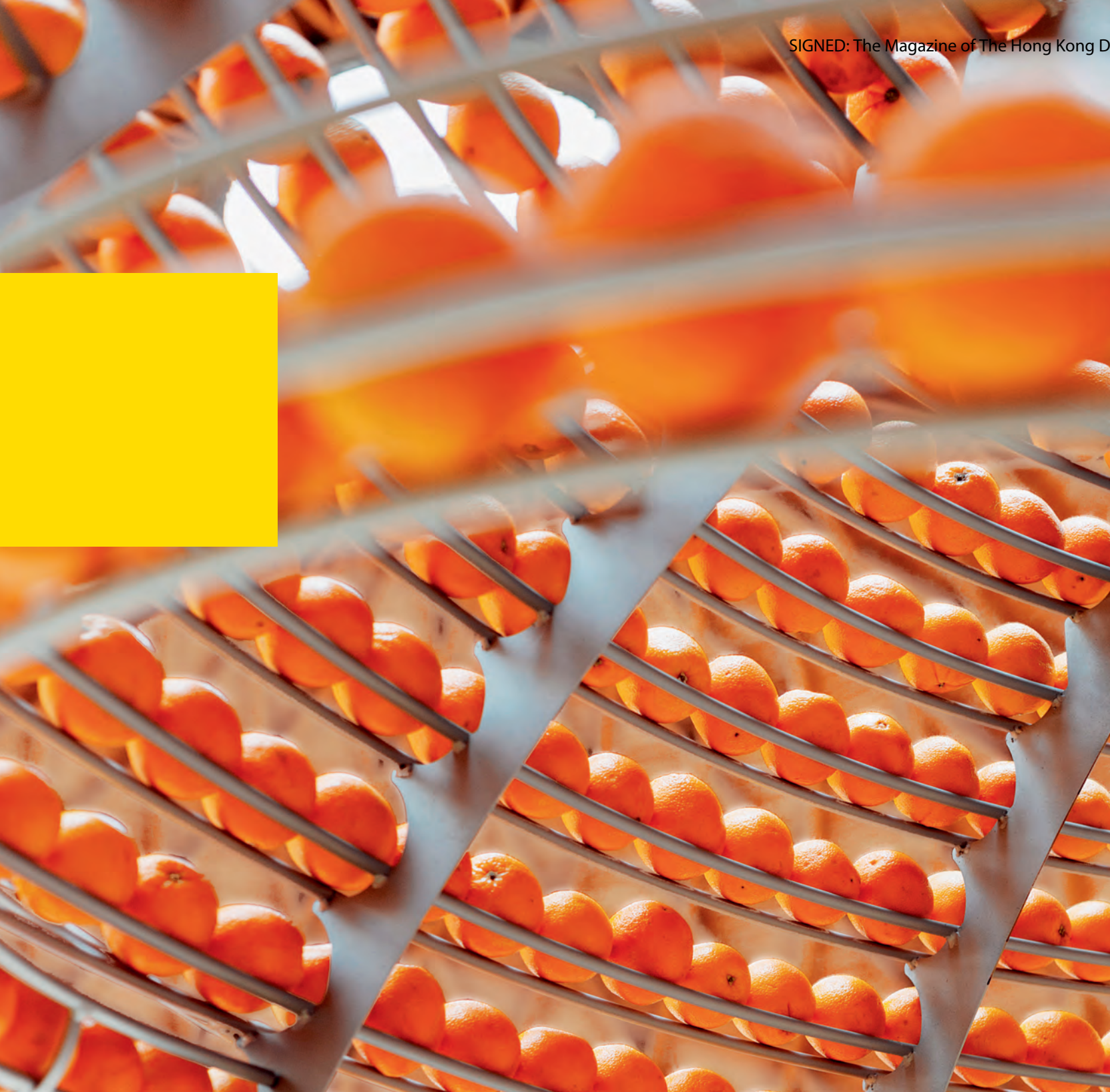
Putting together a fresh meal from scratch adds so much to its taste, and gives a warm satisfactory afterglow. In the future, can we also anticipate making the crockery and cutlery on demand to accompany these meals? Some designers in Italy certainly think so.



CRA-Carlo Ratti Associati

An international design and innovation office, based in Turin, Italy, with branches in New York and London. The firm's scope is broad, from furniture to urban planning, and their work focuses on innovation in the built environment.
www.carloratti.com

CRA, Carlo Ratti Associati, 是一間跨國設計與創新工作室。總部位於意大利都靈，並在紐約和倫敦皆設有分部。公司業務專注於創新和建築環境。它的設計範圍非常廣泛，從家具到城市規劃都能勝任。
www.carloratti.com



A dome consisting of 1500 shining oranges suspended 3-metres above the ground is going to get attention. Knowing the machinery below the dome provides freshly squeezed orange juice, explains the surrounding queue. But, discovering that this juice stand is actually a miniature food processing and cup manufacturing plant, well that is harder to get your head around. Dubbed Feel the Peel, this example of hyper-localised up-cycling is helping to reshape our understanding of how to make best use of the resources at our disposal.

Feel the Peel operates on a seamless mixture of old and new methodologies. Gravity-fed oranges from the canopy are automatically halved and squeezed, before making their way to the base of the juice stand for drying of the skins. After they are suitably dehydrated, the skins are then powdered and mixed with Polylactic Acid (PLA), an organic plastic compound, to create the bio-plastic filament used to manufacture cups to dispense the orange juice.

At the heart of this automated juice squeezer is a 3-D printer that, before your eyes, prints concentric layer upon layer of bio-plastic filament to create a little cup in which to dispense the freshly squeezed juice. Fill a cup, and the cycle gets kicked off once more. The orange PLA cups can also be washed, disinfected and reused several times before returning to the earth as compost, hopefully to fertilize an orange grove.





Commissioned by Italian energy giant Eni, the CRA-Carlo Ratti Associati design and innovation office developed Feel the Peel as an experiment in circular design. "The principle of circularity is a must for today's objects," says Carlo Ratti, founding partner at CRA and director of MIT's SENSEable City Lab. "Working with Eni, we tried to show circularity in a very tangible way, by developing a machine that helps us to understand how oranges can be used well beyond their juice."

This project is the one of a series of collaborations between CRA and Eni that explore circularity and design with different materials. Among the previous projects, the prize-winning Circular Garden at Milan Design Week 2019 used mycelium from mushrooms as a recyclable building material, and the circular restaurant at the 2018 Maker Faire in Rome explored how Solid Urban Waste (FORSU) from food processing, such as frying oil, could produce a second generation biofuel, and polystyrene was recycled for use in the heat insulation sector. Plans are also underway for even more usage of orange peel, coffee grounds, and mycelium as construction materials.

The Feel the Peel prototype is still owned and used by Eni, but interest in the project remains very high, and it is attracting commercial attention. CRA's plans, however, are not stopping at the juice-to-cup cycle. With an eye to the future, Rati notes that "The next iterations of Feel the Peel might include new functions, such as printing fabric for clothing from orange peels."



從零開始準備飯菜令食物本身增味不少，自家製的心意也讓餐桌周圍蒙上一層暖意。但如果連廚房用具和餐具也能在餐前製作呢？Feel the Peel就是這樣一個極具未來感的裝置。表面上看，它是一台便利的橙汁機，但同時，它還是一個即時製作果汁杯的環保再利用器械。

種直接明瞭的方式展現出日常生活中循環利用的方式，但這不是CRA第一次與Eni合作。兩家公司曾經還嘗試過用蘑菇中的菌絲體製作建築，和利用廢棄食用油生產新能源。目前，包括菌絲在內的多種食物殘渣都正在被實驗成為建築物料的可能性。同時，CRA也正在為橙皮尋找下一項功能，或許不久的將來你就能將它穿上身。

Feel the Peel的橙汁製作原理與市面上的大型果汁機大同小異，都是將柳橙分成兩半擠出果汁。但在這台機器中，本應被丟棄的果皮卻被轉移到榨汁機底部脫水、磨粉，再與可降解塑膠聚乳酸(PLA)混合，成為果汁杯的內壁。在這台全自動榨汁製杯機的中心，是一個3D打印機，由它打印出的果汁杯包圍橙皮內壁，再裝入新鮮果汁，這個過程在機器中週而復始。用過的果汁杯可以被清洗和反覆使用，在丟棄後也能降解，甚至可以被用於農作物肥料。

Feel the Peel是設計公司Carlo Ratti Associati(CRA)在意大利能源公司Eni的邀請下製作出的循環設計樣品。創始合夥人Carlo Ratti說：「循環利用的原則是今日產品的必需品。」橙汁機以一