



# SUSTAINABILITY

Homa

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## 01 FOREWORD 奥马二十周年呈献：绿皮书前言

As pure OEM producers, one of the key factors of our success is the timely understanding of our clients' needs in terms of serving their own customers' aspirations. Being able to recognise trends and signals in the world markets indicating shifts in demand is critical to our business. Working with global clients means we need to be constantly anticipating those needs.

奥马冰箱，专注全球冰箱的研发与制造，能够敏锐洞察消费者对冰箱的诉求，从而赋能客户——这正是奥马的一大成功秘诀。对我们来说，洞察全球市场上的需求变化和消费趋势至关重要。奥马的客户遍及全球，这也要求我们能够持续预测前沿需求。

As we often say, listening is one of our greatest skills, and part of our culture. Caring is another one, and we feel a great sense of responsibility when it comes to the future of our planet, as the products we manufacture can and must play an important role in changing the current state of things. We know our clients' customers are not prepared to compromise on this subject since they will be using their appliances every day for the next 8 to 10 years.

正如我们常说的那样，倾听全球客商和用户是奥马企业文化的一部分。奥马也关爱我们的地球，深知作为冰冷制造行业的领军企业之一，我们生产的产品会给这个地球带来影响，而我们有责任去把影响降到最低，并起表率作用。因为我们知道，我们生产的产品将会成为全球消费者生活的重要部分，至少在未来的 8-10 年内每天都会被使用。

We have long recognised this trend, and have focussed our efforts both on our industrial process and on the actual performance of our products. We have made enormous progress in terms of energy classes, and lifted our entire production towards high energy efficiency standards as well as overall recyclability, the best way for us to leverage economies of scale and remain highly competitive. We make a point of using the latest, established technologies to offer products that are attractive and have compelling design, but that are also champions of energy-efficiency. Next year Homa will turn 20. Over the years we have introduced many innovative platforms, but always with great attention for the environment. For instance, we have started using R600a refrigerant gas right from the beginning, potentially saving the atmosphere millions of tonnes of ozone-depleting substances. All the instruction manuals of the 9 million refrigerators we produce every year are printed with eco-friendly soy-based ink on recycled paper. Every product in our range beats industry average in terms of energy-efficiency. When introducing new features, we have started using more metal, which is easily recyclable, and less plastics.

奥马早早地洞察到这一趋势，集中精力优化生产过程并提升产品性能。奥马在能效方面取得了巨大进展，不仅提升了整个产品阵容的能效等级，同时实现了各环节的可循环性，从而进一步扩大了经济规模和竞争优势。奥马坚持使用成熟的前沿技术，致力于为消费者提供外观精美、设计高端的低能耗产品。2022 年将迎来奥马冰箱成立 20 周年。多年来，尽管奥马不断推陈出新，但始终高度重视环境保护。例如，奥马从创立之初就开始使用 R600 制冷剂，由此减少了数百万吨潜在的消耗臭氧层物质排放；奥马每年生产 900 万台冰箱，配套说明书均采用环保大豆油墨和再生纸张印刷；每台奥马冰箱的能效表现都超过行业平均水平；在开发新功能时，我们避免使用塑料，更多采用可循环利用的金属。

In our trade, credibility is everything, and we want to pass on that credibility to our clients, whose brands will be held accountable for their products' impact on our planet. In April 2022, Homa will reach the 100 million refrigerators mark. At the moment you are reading this article, around 50 million Homa refrigerators are actually switched on, and 1 in 5 such products on display in any appliance store on the planet has come out of our production lines. A motive of celebration, but also of deep reflection. For this reason, we are glad to share some of our thoughts on the matter.

在冰箱行业，声誉至关重要。对客户来说，产品对地球的影响直接关系到其品牌声誉，奥马冰箱有能力为客户声誉保驾护航。截至 2022 年 4 月，奥马生产的冰箱数量突破 1 亿大关。在你阅读这篇文章之时，大约有 5000 万个家庭正在用着奥马制造的冰箱。全球电器商店所展示的冰箱产品中，有五分之一来自我们的生产线。此时此刻，我们不仅要庆祝，更应反思。因此，很荣幸在接下来的内容里与大家分享我们对冰箱行业的洞察。

2022 年 3 月

奥马冰箱总裁 姚友军

### 02 GO FORTH AND GROW HAPPILY: SMART & SUSTAINABLE IS THE NEW PARADIGM 拥抱愉悦的经济增长：新模式离不开“智能化”和“可持续”

An eye-opening interview with Francesco Morace, founder of Future Concept Lab, about how to reconcile economic growth and the preservation of our planet.

此次我们采访了研究机构 Future Concept Lab 的创始人 Francesco Morace，他就如何在经济增长和环境保护之间取得平衡表达了独到的见解。



*“Degrowth theories correctly diagnosed the disease, but got the cure wrong”*  
*“去增长理论诊对了病症，却开错了药方”*

Q - How can we continue growing our economies and maintain our current consumption levels, without irremediably harming our planet?

问 - 如何才能在持续推动经济增长并维持现有消费水平的同时，避免对地球造成无法补救的伤害？

R - We all agree that our growth model over the past decades is not sustainable. In that, degrowth theorists had the correct intuition, but the cure they suggested is inapplicable. Stopping the development of world economies, and even de-scaling them, simply will not happen. Nobody is prepared to make radical concessions on their lifestyles. Being “against” industry in general, or multinationals, antagonising market economies, hasn’t produced the expected outcome and certainly didn’t win over the masses. We must think differently.

答 - 我们都知道，过去几十年的增长模式是不可持续的。在这一点上，去增长理论学家的

直觉是正确的，但他们提出的方案并不可行。让世界经济停摆、甚至倒退，简直是天方夜谭。没有人愿意在现有生活方式方面做出让步。无差别地“抵制”工业、跨国公司和市场经济，并未产生预期效果，也没能赢得公众认可。我们必须换个角度思考问题。

Awareness about the issue has grown tremendously in our societies, especially in the younger generations. Our consumption habits are actually changing in the light of this increased sensitivity, and in a profound way but not in the sense of a radical reduction of our social metabolism. We are not consuming less, but differently. The way we go about purchasing a new appliance, for instance, has completely changed from only a few years back. The “Fridays for future” generation, the adults of tomorrow, is already a lot smarter and attentive in its buying decisions and is pushing the older generations into action. Industry, on its part, is quickly responding to this accelerating shift in demand towards environment-friendly products and services, not because of a new-found idealistic temperament, but because it makes good business sense. Moreover, reputation is an ever more important part of a company's brand equity, and is now solidly linked to its sustainability stance.

在当代社会，人们——尤其是年轻人——对环境问题的认识水平大幅提升，由此驱动了消费习惯的深刻变革，但这并不会抑制社会经济正常运作。人们并没有减少消费，而是换了一种方式消费。就说新电器，如今的购买方式也已与几年前大不相同了。提倡“气候罢课运动”的年轻人，即未来社会的中坚力量，在购买决策方面已变得更加明智周全，并且正带动年长的人群参与到行动中来。消费者对环境友好型产品和服务的需求日益增长，制造业迅速对此作出响应，但不是出于理想主义的考量，而是为了赢取更高的商业利益。此外，声誉在企业品牌资产中的重要性日益凸显，而就目前来说，品牌声誉与品牌的可持续发展立场息息相关。

In 2016, Ulrich Beck, author of “The Metamorphosis of the World” (Polity Press, 2016) said that “climate change is transforming our concept of the world”. He also predicted that these changes in our societies would be perceived by multinationals before governments. He was right. Nowadays, while world governments still struggle to come to an agreement on the common goals to be pursued and translate them into national legislation, it is not uncommon to see large organisations include sustainability objectives, alongside financial and economic performance, in their mission statements. And the trend is on the upside.

2016年，Ulrich Beck在其著作《世界的蜕变》（英国政体出版社，2016年）中表示：“气候变化持续改变着人们对世界的看法。”他还预言跨国公司将先于政府感知到社会变化。千真万确。如今，各国政府还在着手制定共同发展目标，以便后续出台法规落实这些目标。但与此同时，众多大型企业已将可持续发展目标纳入企业使命，与财务和经济目标地位相当，而且越来越多的企业都在这样做。

Q - You mention “smart” as part of the solution...

问 - 您在解决方案中提到了“智能化”……

R - Yes, and that's the second part of the equation. Smart & Sustainable is the new paradigm for a growing world economy that also effectively addresses climate change, helping to preserve and restore our natural environment. I like to call it “happy growth” (Morace, Francesco, Crescita Felice, Egea, 2015) for it does away with a sense of guilt that was hindering

the debate. The digital revolution has a key role to play here. Smart technologies, big data, smart cities and our connected societies allow for an unthinkable level of precision in monitoring consumer habits and market trends, providing predictive models that help reducing waste and consumption of energy and other resources. The same instruments also serve to optimise virtually every process in our economies, and can easily be oriented towards reaching CO2 reduction objectives.

R - 没错，这是实现平衡的第二大要素。智能化和可持续代表着全球经济增长的新模式。这种模式不仅能有效地应对气候变化，还有助于保护和修复自然环境。我称之为“愉悦的经济增长”（Francesco Morace, 《Crescita Felice》，Egea 出版社，2015 年），因为这种增长模式消除了损害自然环境所带来的负疚感。在这个过程中，数字革命扮演着至关重要的角色。得益于智能技术、大数据、智慧城市和互联社会，我们对消费者习惯和市场趋势的监测日趋精准，由此构建出的预测模型可以有效减少浪费及能源和其他资源的消耗。这些模型还有助于优化经济活动的其他各环节，助力二氧化碳减排目标的实现。

Smart is also to be intended in a bottom up perspective, as a responsible attitude on the part of each and everyone of us. A lot can be achieved through virtuous and environmentally conscious individual behaviours, from recycling and reusing to a greater attention to what we eat, to personal mobility and to the many choices we constantly make in conducting our every day lives.

此外，每个人都应肩负起责任，自下而上地推进智能化。在做日常生活的各类决策时，应有意识地选择对环境更友好的行为。例如，加强回收利用、关注绿色饮食、改变出行方式等，从而为实现环保目标添砖加瓦。

The recent lockdown periods we were all forced into to varying degrees, have brought about profound changes in our behaviours over a relatively short period of time. In the recent past, such a rapid and radical transformation was absolutely unthinkable. For one thing, digital, which was accused of destroying our social lives prior to the pandemic, was the very instrument of our social salvation during the dark months of isolation.

近来，或长或短的居家隔离经历快速而彻底地转变了人们的行为模式。在此之前，没有人料到这种转变的速度之快、程度之深。值得一提的是，疫情爆发之前，有人指责数字化破坏了社会生活；可是在艰难的隔离时期，正是数字化为人们的生活提供保障。

Q - Nowadays we tend to shop less frequently, hence the need for larger fridges to store greater quantities of supplies. How does that affect our sustainability?

问 - 如今，人们倾向于降低购物频率，因此需要更大的冰箱来储存更多的物资。这对可持续目标有何影响？

R - There is no right or wrong here. Variety of behaviours is vital for our developed societies. We must be free to choose what suits us best, as long as we keep climate issues in mind. On one hand, bulk buying helps save on trips to the supermarket and optimise our shopping while reducing waste, but the opposite trend is increasingly significant: Shopping more frequently, privileging local, fresh and seasonal foods that aren't mass produced nor excessively processed. A large part of these products get consumed on a daily basis, so they

don't need such big refrigerators, which in turn leads to savings on energy consumption, raw materials and transportation. Whatever the smart personal choices, industry has a key responsibility and a central role to play in providing the smart processes and products that will eventually help us reach our sustainability objectives and win the battle for the survival of our planet.

答 - 在这点上没有对错之分。行为多样性正是社会发展的主要推动力之一。在不影响气候的前提下,人们有权自由地选择最适合自己的生活方式。一次性购买大量物资可以省去往返超市的奔波,既能改善购物体验,又能减少能源和资源浪费;而提高购物频率,优先选择当地当季、未经过批量生产或过度加工的新鲜食材,也受到许多人的追捧。这种方式能减少能源和原材料消耗并降低运输成本。并且由于所购买的产品中有很很大一部分是日常必需品,所以并不会占用太多的冰箱空间。无论人们为推进智能化做出了什么样的决策,整个产业链都有责任、有义务为消费者提供智能化工艺和产品,以最终实现可持续发展为目标并帮助地球赢得这场生存战。

**Future**  
LAB **concept**

Francesco Morace, 社会学家、作家, 深耕社会学和市场研究领域四十余年, 研究机构Future Concept Lab的创始人。Future Concept Lab为全球企业和机构提供战略咨询。自1981年以来, 先后在欧洲、亚洲、北美和南美的多个国家举办会议、课程和研讨会。



2009年至2020年, Francesco Morace在米兰理工大学担任“时尚趋势预测”教授, 先后撰写了20多本书籍, 均由Egea出版社出版, 包括:《La rinascita dell'Italia. Una visione per il futuro tra etica ed estetica aumentate》(2020年)、《Il Bello del Mondo》(2019年)、《Futuro + Umano》(2018年)、《Crescere. Un Manifesto in dodici mosse》(2017年, 意大利语平装本)、《ConsumAutori. I nuovi nuclei generazionali》(2016年, 意大利语和英语平装本)、《Crescita Felice. Percorsi di futuro civile》(2015年, 意大利语平装本)、《Italian Factor. Come moltiplicare il valore di un Paese》(2014年, 意大利语平装本)。

→ [www.futureconceptlab.com](http://www.futureconceptlab.com)



### 03 COP26 – GLASGOW 2021: BURNING JUSTICE OR WASH OUT?

#### 2021 年格拉斯哥第 26 届联合国气候变化大会：一碗水端平了吗？

“This is a fragile win. We can now say that we have kept 1.5°C degrees alive. But its pulse is weak and it will only survive if we keep our promises and translate commitments into rapid action”. Alok Sharma, president of COP26.

“这仅仅是迈向成功的一小步。尽管各国承诺守护住 1.5 摄氏度的红线，但现状依然严峻。要想真正达成目标，各国必须信守承诺并将其落实到快速行动上。”阿洛克·夏尔马（Alok Sharma），第 26 届联合国气候变化大会主席。

Is this a message of hope or deep anxiety? It's ambiguous, at best. But what exactly was COP26, and why this shaky statement by its president?

看到这个消息，很难说应该感到希望还是担忧。那么，究竟什么是第 26 届联合国气候变化大会，为什么大会主席的发言如此模棱两可？



In 1994, 197 members agreed on the United Nations Framework Convention on Climate Change (UNFCCC). Each member is a 'party' to the treaty, so COP stands for Conference of

the Parties - COP26 was their 26th meeting.

1994 年，联合国 197 个成员国就《联合国气候变化框架公约》(UNFCCC) 达成一致。每个成员国都是该公约的“缔约方”，因此第 26 届联合国气候变化大会即《联合国气候变化框架公约》第 26 次缔约方大会。

Over the years, it's been tricky to hammer out agreements on making the difficult changes needed to halt or reverse climate change, despite the increasing urgency in all parts of the globe. There are so many competing interests between states with their own domestic priorities and economies, and the countries and territories traditionally most affected by climate change have been those with the least power and influence over policy. But in 2015, the Paris Agreement made some progress among members, agreeing to:

阻止或扭转气候变化任重而道远。多年来，尽管世界各国对气候问题越来越重视，但却很难在应对措施上达成一致。这是由于每个国家的发展重点和经济战略不同，存在诸多利益冲突。受气候变化影响最大的正是那些在政策制定中话语权和影响力最小的国家或地区。但 2015 年签订的《巴黎协定》取得了一些进展，各成员国同意：

- Reduce the amount of harmful greenhouse gases produced and increase renewable types of energy like wind, solar and wave power
- Keep global temperature increase "well below" 2C (3.6F) and to try to limit it to 1.5C
- Review progress made on the agreement every five years
- Spend \$100 billion dollars a year in climate finance to help poorer countries by 2020, with a commitment to further finance in the future.
- 减少有害温室气体的产生，增加可再生能源，如风能、太阳能和波浪能
- 把全球气温升幅控制在“远低于”2 摄氏度（3.6 华氏度）的范围内，尽量不超过 1.5 摄氏度
- 每隔五年对《巴黎协定》取得的进展做一次审查
- 到 2020 年，每年为发展中国家提供 1000 亿美元气候资金，并承诺在 2020 年后持续加大扶持力度。

Climate activists protested that these measures were nowhere near enough. After all, when the house across the road from your own is burning, do you sit down with your neighbour for a chat and decide that in half an hour the two of you will stroll across there with a cup of water to help out?

气候活动家对此嗤之以鼻，认为这些措施远远不够。在他们看来，这无异于看到马路对面的自家的房子正熊熊燃烧，还闲坐着跟邻居聊天，半小时后才和邻居一人端着一杯水，慢悠悠地走过去帮忙灭火。

Sea-level rise (SLR) will significantly alter coastal landscapes through inundation, erosion and salt-water intrusion of low-lying areas worldwide. Considering that 10% of the world's population inhabits areas less than 10 m above sea level... the most dramatic and immediate effects of SLR will be the inundation of coastal lowland areas. (Impact of Relative Sea-Level Rise on Low-Lying Coastal Areas of Catalonia, NW Mediterranean, Spain. Uxía López-Dóriga, and José A. Jiménez).

海平面上升 (SLR) 会淹没、侵蚀全球低洼地区并产生咸潮，大幅改变沿海风貌。鉴于全球 10% 的人口居住在海拔 10 米以下的地区，其中最危急的影响是沿海低洼地区将遭到淹没。

(《相对海平面上升对西班牙地中海西北部加泰罗尼亚低洼沿海地区的影响》，Uxía López-Dóriga 和 José A. Jiménez)。

But at least the Paris agreement was a move in the right direction. Then in a further positive move, in 2019, COP25 met in Madrid, and each nation agreed to cut their carbon emissions by the next meeting in Glasgow.

但至少《巴黎协定》朝着正确的方向迈进了一大步。2019 年在马德里举行的第 25 届联合国气候变化大会则更进一步：各国均承诺将在下届格拉斯哥大会之前削减其碳排放量。

The world is now about 1.2C warmer than it was in the 19th Century - and the amount of carbon dioxide in the atmosphere has risen by 50%.

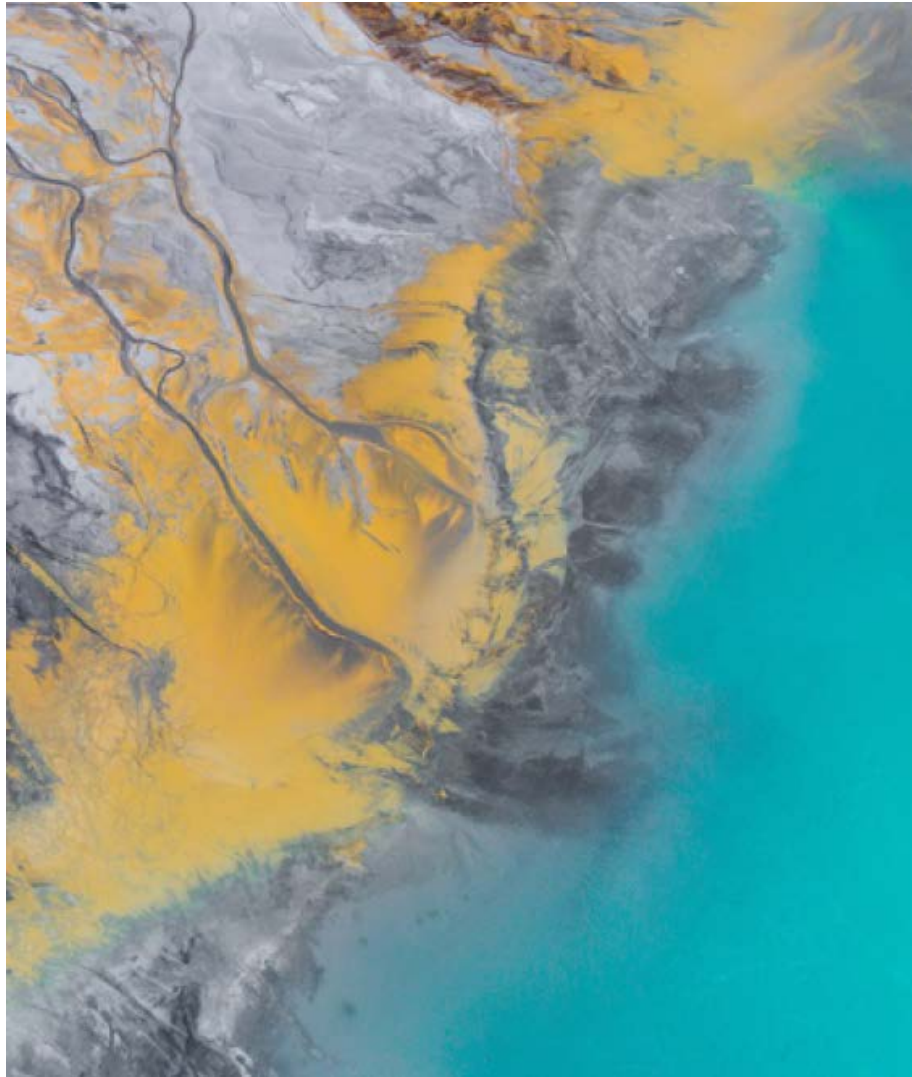
当前，全球气温比 19 世纪的时候升高了约 1.2 摄氏度，大气层中的二氧化碳含量已上升 50%。

So now here we are in 2021 at the COP26 meeting in Glasgow, delayed by one year because of Covid19. What were the hopes and the outcomes?

因此，今天我们相聚在格拉斯哥，举办 2021 年第 26 届联合国气候变化大会，探讨各国针对气候变化的期待和取得的成果。本届会议原定于 2020 年举办，因受新冠疫情影响而推迟了一年。

“New Glasgow climate pact offers some ‘breakthroughs’ but also ‘deep disappointment’” (France24)

“新的《格拉斯哥气候公约》实现了一些‘突破’，但也带来了‘深深的失望’”（法国 24 电视台）



It is now known that we must halve global emissions by 2030 in order to keep worldwide temperatures at a level that will not provoke a wholesale catastrophe.

如今我们已意识到，如果全球气温继续上升，将会引发大规模灾难。为了避免这种情况发生，必须在 2030 年之前实现全球碳排放量减半。

To best manage this, it had been hoped that there would be an agreement in Glasgow to really accelerate the rate of change with a commitment from all countries to phase out the use of fossil fuels and coal, but in the end this was down-graded to a 'phasing down' of coal usage. However, this is significant as the first time fossil fuels have been mentioned in any COP text, despite the fact that they are responsible for 90% of the greenhouse gas emissions which cause rising temperatures.

为了达成这一目标并加速全球减碳进程，《格拉斯哥气候公约》将“承诺逐步淘汰化石燃料和煤炭”写进了拟定草案，但最终各国仅同意“逐步减少煤炭使用”。即便如此，这项成果仍意义非凡，因为这是首次在联合国气候变化大会官方文件中提到化石燃料。要知道，导致气温升高的温室气体中，约 90%来自化石燃料的燃烧。

When talking about climate-induced temperature rises, we measure against pre-industrial

levels. The previous “well-below” 2.0C levels agreed in Paris would have taken us to a potential 3.7C rise against those pre-industrial levels by the end of the century, catastrophic for humanity.

我们以工业化前的水平为参照来衡量气候变化引起的气温上升。如果按《巴黎协定》“远低于”2 摄氏度的标准执行，到本世纪末，全球气温较工业化前水平将升高 3.7 摄氏度，这对人类来说是灾难性的。

Now, with the decision in Glasgow for a 1.5C global temperature limit, the outcome is still uncertain, but there is a better, if small, chance of keeping the world safe.

现在，《格拉斯哥气候公约》决定将全球气温升幅限制在 1.5 摄氏度之内。尽管结果仍不确定，但仍是为全球安全增添了些许保障。

With temperature levels now truly front and centre of attention, a second positive to come out of COP26 is the decision to speed up national efforts to reduce emissions and contribute to climate solutions, with the next check-in at the end of 2022. Unlike the previous five year intervals, more frequent accounting among the nations will tighten scrutiny and commitment to action.

当前，气温水平已成为人们关注的焦点。第 26 届联合国气候变化大会的第二大突破是决定于 2022 年末审查各国进展，这将加快各国的减排进程并推动气候方案的出台。先前定下的审查间隔为五年，更高的审查频率意味着审查力度正在加大，有助于推动各国把承诺落实到行动上。

On top of these crucial decisions around emissions, the power of nature was recognised in its ability to combat the climate crisis. \$20bn from private and public sources was committed to forest protection, and more than 100 countries pledged to reverse deforestation by 2030 at the latest.

除了与排放相关的重要决策外，各国也同意依靠大自然的力量来应对气候危机——将拿出 200 亿美元的私人 and 公共资金用于森林保护，并且超过 100 个国家承诺最迟到 2030 年扭转森林砍伐的现状。

On the other hand, one of the greatest disappointments of COP26 was felt by the most vulnerable nations, who encountered a deep lack of financial support for their experience of rapid loss of homes and livelihoods, and damage to land and infrastructure. As Barbados's Prime Minister Mia Amor Mottley said in her address to the delegates, for her country, a 2-degree Celsius rise in global temperature would be a "death sentence."

另一方面，受气候影响最大的发展中国家在第 26 届联合国气候变化大会上感到大失所望。这些国家的土地和基础设施遭到破坏，人民失去了家园和生计，严重缺乏资金支持。正如巴巴多斯总理米娅·莫特利（Mia Amor Mottley）在代表发言中所言，全球气温上升 2 摄氏度意味着给巴巴多斯“判了死刑”。

Outside the Glasgow venues and via media around the world, climate activists demonstrated and spoke vociferously against what they saw as a lack of meaningful action, while certain commentators found some areas of very cautious optimism.

在格拉斯哥的会场外，环保支持者通过媒体痛斥本次活动缺乏有意义的行动纲要，小部分人对某些措施保持观望而乐观的态度

So the jury is out while the clock ticks on. Can and will the COP countries take their commitments seriously, pay the sums of money they have promised, take actions through law and influence to make serious and rapid changes to cut emissions? Or will they shake off the dust of COP26 with a sigh of relief that it is over for another year, avert their eyes, and make music to another tune, while the planet burns?

审查时间将近，但行动的方向性依然悬而未决。各缔约方是否有能力、有意愿遵照承诺，投入资金、出台法规，并借助政府影响力落实各项行动，从而切实有效地推进减排变革？还是说，各国会在第 26 届联合国气候变化大会结束后拂袖而去，从此将承诺置之脑后并放任地球一天天变暖？



For those in the forefront of climate change research, and populations that are directly affected by floods, drought and wildfires, tackling carbon emissions is an urgent and ever-present topic of concern. For the rest of the world, while awareness of the impact of rising global temperatures may be slowly increasing, it is still not a matter of great urgency, and for everyone since early 2020 the Covid19 pandemic has taken centre stage as the most pressing issue the world faces.

解决碳排放问题，不仅对于气候变化前沿研究人员来说刻不容缓，对于直接遭受洪水、干旱以及野火灾害的人们来说，更是迫在眉睫。尽管世界其他地区的居民也逐渐意识到全球变暖的危害，但他们还没有察觉到问题的紧迫性。而新冠疫情自 2020 年年初爆发以来，便一直占据全球话题榜首，牵动着每个人的心。

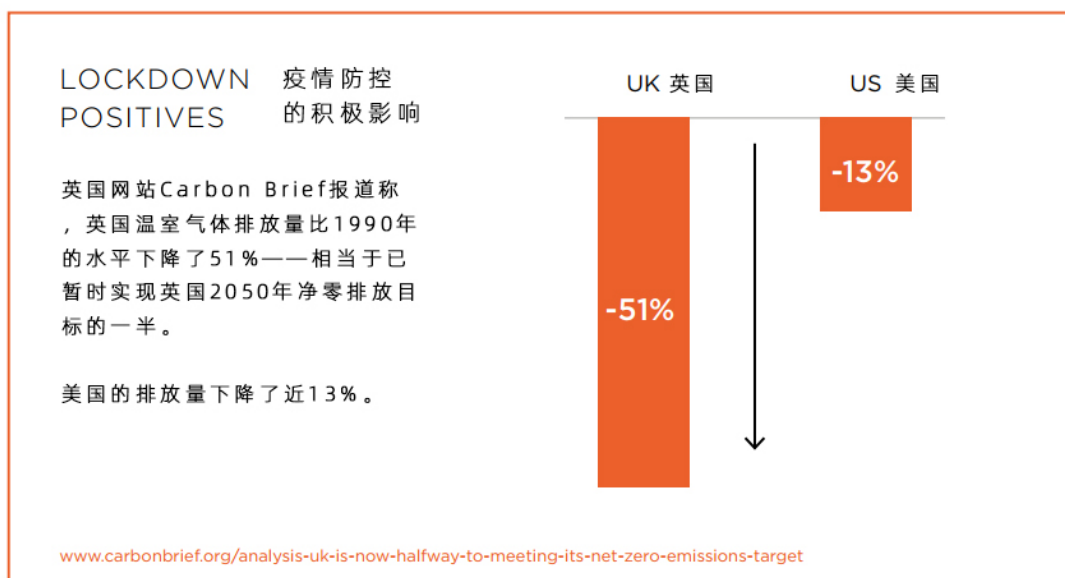
But is there any evidence to show whether the emergence of Covid19 and climate change are linked, and can we learn lessons from how authorities, health agencies, businesses and individuals have responded to the crisis as we take future action on the climate?

然而，是否有证据表明新冠疫情的爆发与气候变化有关？政府当局、卫生机构、企业和个人对新冠疫情的应对能够给未来的气候行动带来哪些启示？

First question, did the global lockdowns reduce harmful emissions in the Earth's atmosphere? With hardly any planes flying, cars off the road and much manufacturing at a standstill, this seems a no-brainer, and in fact a study published in May 2021 showed that globally, carbon dioxide emissions dropped by nearly 7% in 2020. However, the study concludes that this drop

is too small in both magnitude and duration to have any significant impact on global climate, and the World Meteorological Organization reported that overall levels of carbon dioxide in the atmosphere still increased in 2020 compared to 2019.

首先要思考的是，在世界各地执行封锁措施期间，大气中的有害物质排放量是否有所减少？由于航班、汽车大面积停飞停驶，加上制造业大规模停工，答案不言而喻。2021 年 5 月发表的一项研究表明，2020 年全球范围内的二氧化碳排放量减少了近 7%。然而，该研究得出的最终结论是，这样的下降幅度和持续时间还不足以对全球气候产生显著影响。此外，世界气象组织的报告指出，与 2019 年相比，2020 年大气层中的二氧化碳总体水平仍有所上升。



A tiny sliver of good news is that as carbon dioxide disperses very slowly from the atmosphere, we may see lockdown-influenced decreases in the future, particularly if post-pandemic recovery plans build in carbon neutral measures. An example is South Korea, which is advancing an ambitious climate agenda to support its recovery, while the European Union's €750 billion recovery plan dedicates 25% of total stimulus funds for climate friendly measures, including supporting renewable energy and shifting to sustainable agriculture. The 2021 COP26 meeting also secured a vital commitment among members to keep the global temperature rise to 1.5% over pre-industrial levels.

有个潜在的好消息是，由于二氧化碳在大气层中扩散速度很慢，所以疫情防控措施对减少碳排放的作用可能会在未来显现出来。如果后疫情时期大部分城市都将碳中和举措融入经济复苏计划中，减碳作用会更明显。韩国正在推出气候新政，以期推动疫后复苏。欧盟的复苏计划资金达 7500 亿欧元，其中 25% 的总激励资金将投入气候友好措施，用以扶持可再生能源和可持续农业转变。2021 年的第 26 届联合国气候变化大会上，各成员国更是达成重要共识，承诺要将全球气温升幅控制在工业化前水平的 1.5% 之内。

### Air quality

#### 空气质量

Air quality is one of the areas where climate change and Covid19 intersect. Carbon emissions from fossil fuels cause a deterioration in the air quality in cities, and extreme weather



conditions drive wildfires that can drastically affect the breathable atmosphere, as recently seen in Australia, Southern Europe and North America. Recent research at Harvard has found that people who live in places with poor air quality are more likely to die from Covid19 even when accounting for other factors that may influence risk of death such as pre-existing medical conditions, socioeconomic status, and access to healthcare. This study found that a small increase in long-term exposure to PM2.5 particulates leads to a large increase in the Covid19 death rate.

空气质量不仅与气候变化息息相关，与新冠疫情更是有着千丝万缕的联系。化石燃料燃烧产生的碳排放会使城市空气质量恶化，而由极端天气条件导致的野火也会加重空气污染。近来在澳大利亚、南欧和北美就出现了这种情况。哈佛大学最近研究发现，如果人们所居住的地区空气质量较差，那么新冠疫情的致死几率将增大。该项研究已将可能影响死亡几率的其他因素考虑在内，如既往病史、社会经济地位和就医便捷性。该项研究同时发现，如长期暴露在 PM2.5 环境中，即使是小幅的 PM2.5 上升，也会导致感染新冠疫情后的死亡几率显著增加。

### **Growth in pandemics**

#### **流行病多发**

Many of the root causes of climate change also increase the risk of pandemics. Deforestation, which occurs mostly for agricultural purposes, is the largest cause of habitat loss worldwide. Loss of habitat forces animals to migrate and potentially contact other animals or people and share pathogens. Large livestock farms can also serve as a source for spillover of infections from animals to people.

引起气候变化的许多根本原因同样也是流行病传播的背后推手。农业的发展使森林遭受滥砍滥伐，继而造成全球动物栖息地丧失。由于缺少栖息地，动物被迫迁徙，可能会沿途向人类或其他动物传播病原体。人类从大型牲畜养殖场感染疾病的情况也时有发生。

Research has shown that high biodiversity reduces the risk of animal to human spillover. The recent Ebola epidemic in West Africa probably occurred in part because bats, which carried the disease, had been forced to move into new habitats because the forests they lived in had been cut down to grow palm oil trees. In mosquito- and tick-borne diseases, where there is a high diversity of wild vertebrates in a particular area, the mosquitoes and ticks feed on them instead of people. This results in lower infection rates in humans.

研究表明，提高生物多样性可降低动物向人传播疾病的风险。在西非，为种植油棕树，蝙蝠栖息的森林遭到砍伐，因而它们不得不迁移到新的栖息地，而蝙蝠身上所携带的病毒正是近期西非埃博拉疫情爆发的原因之一。如果某个地区的野生脊椎动物多样性较高，那么蚊子和蜱虫就会以它们而非人类的血液为食，从而降低人们患蚊媒和蜱虫传染病的几率。

### **Investing in public health**

#### **投资公共卫生事业**

A good baseline of health among the population, through the provision of healthcare, affordable healthy food and food education, and incentives to exercise more helps people develop strong immune systems and reduces their risk of developing conditions such as diabetes and heart disease. They are thus more able to resist very serious or fatal infections by new diseases such as Covid19.

完善医疗保健体系、提供实惠的健康食品、普及食品知识并推动全民健身，有助于提高人民健康水平，进而帮助人们增强免疫力，并降低患糖尿病、心脏病等疾病的风险。这同时也有助于抵御重大或致命性新疾病，如新冠疫情。

### **So what can the pandemic teach us about tackling climate change?**

#### **新冠疫情能给气候变化的应对带来哪些启示？**

Governments showed that they can take fast and unpopular measures when necessary, individuals on the whole will follow the political lead and the science, and scientists around the globe collaborated almost miraculously to understand Covid19 and come up with vaccines in record time.

经验表明，政府可在必要时采取快速的强制性措施，因为总体来说，个人最终会服从政治领导和科学。全球科学家则表现出极高的协作度，争分夺秒研制并推出新冠疫苗。

Each country had its own rapid learning curve as Covid19 hit. Until that moment, psychologically it was a problem happening elsewhere, despite all the shocking news reports. But once the virus arrived, we learned that people are motivated by the personal and the actionable. The pandemic endangered the people and the things we care about, and as far as climate change is concerned that is also true. What is important is that this becomes more widely understood, and the same urgency is afforded to collaborating and taking effective actions as has been dedicated to dealing with Covid19.

面对新冠疫情，各国均迅速采取了行动。在疫情真正爆发之前，无论相关新闻报道怎样骇人听闻，人们潜意识里仍觉得事不关己。可是一旦病毒真正到来，人们还是会响应号召并积极行动起来。新冠疫情会威胁到人们所关心的一切人、事、物，气候变化亦是如此。当务之急是加强人们对气候变化紧迫性的认知，从而团结起来，像应对新冠疫情一样高效地采取行动。

*"The biggest climate change myth is that the problem won't affect us as individuals", Katharine Hayhoe, atmospheric scientist*

*"如果认为气候变化不会对个人产生影响，那就大错特错了。"*

*Katharine Hayhoe, 大气科学家*



## 05 REAL GREEN VS GREENWASHING 真正的环保，还是漂绿？

When you're buying a new brand or product, are you seduced by the pretty green leaves adorning the label? Or by the 'eco-friendly' or 'all natural' claim? These message work at an insidious level – after all, we want to do our best for the planet, and we're all attracted by images of nature, but are these marketing ploys telling the whole truth? Or are we falling victim to 'greenwashing'?

面对从未买过的品牌或产品时，标签上印着的漂亮绿叶或“生态环保”、“纯天然”之类的广告词是否会吸引你买下它？由于人们通常倾向于亲近自然，也愿意为保护地球贡献自己的一份力量，所以这些信息会不动声色地影响人们的购买决策。不过，这些营销手段是否实事求是呢？我们是否已陷入“漂绿”的圈套？

Greenwashing is 'an attempt to make people believe that a company is doing more to protect the environment than it is' (Cambridge dictionary). Products and services are greenwashed through massive marketing and PR strategies: rebranding, renaming, repackaging. Greenwashing is all about the idea that products and processes are “chemical-free,” “from natural origins,” and less carbon-emitting and more sustainable than their competitors.

漂绿是指“企业夸大自身环保行为并误导消费者信以为真的做法”（剑桥词典）。为了给产品和服务披上一层“绿色”外衣，企业会采取重塑品牌、更换名称、升级包装等大规模营销和公关策略。漂绿强调产品和工艺“不含化学成分”、“纯天然”，并且相较于竞品，碳排放更少、更加可持续。

But it's easy to make these claims – as consumers we need to stay alert that some company statements might only reveal some of the truth, or at worst, not be true at all. For instance, arsenic is an 'all-natural product' but we wouldn't want to find it in our face cream!

但是打出这些口号并非难事。作为消费者，我们需警惕某些企业在宣传时弄虚作假甚至颠倒黑白。例如，砷的确是一种“纯天然物质”，但绝不能添加在面霜中。

A common example of greenwashing is a claim suggesting that a product is green based on certain characteristics without considering other important environmental issues. For example, just because a paper product comes from a sustainably harvested forest, it is not necessarily environmentally friendly. There may be other important environmental issues in the background, such as the greenhouse gas emissions or chlorine used in bleaching during the paper-making process.

忽略其他重要的环境问题，仅根据某个特征就宣称产品符合绿色理念，是一种常用的漂绿手段。例如，某纸制品通过可持续森林采伐获取原材料，但并不表示该产品就是环保的。其中还可能牵涉其他影响环境的重要因素，如温室气体排放或造纸工艺所用的含氯漂白剂。



### The other side of the coin

#### 绿色环保，货真价实

So what can we do to understand whether a product or service has been greenwashed or not? And how can companies that genuinely wish to behave in a responsible sustainable way prove their integrity to their potential customers?

那么，如何判断产品或服务是否被漂绿了？而那些真正有担当、将可持续落到实处的企业又该如何向潜在消费者证明这一点呢？

As consumers, we need to be on the alert to look below the surface and investigate claims, particularly if we are making a big investment and wanting to make choices that will have an impact on the health of the planet. Can the company claims be verified by third parties? If a product claims to meet named industry standards, is this actually true? A little Internet research these days will usually reveal the truth.

作为消费者，我们需剥丝抽茧，敏锐地探查真实信息。当购买量较大并且希望作出对环境有利的购买决策时更应如此。是否要通过第三方验证企业的宣传？某产品宣称符合指定行业标准，又是否可信？其实如今只要在互联网上稍作搜索，就能挖掘到真相。

Proving your integrity as a company concerned with sustainability derives from your values and the way you bring these to life through all your activities and choices. Your decisions will lead to products and services that genuinely do their job better and make a difference to people's lives rather than just innovating for innovation's sake. Honesty and transparency are the watch words – there's nothing wrong with a great marketing campaign to sell an amazing new product when it really meets a need and has been developed and produced sustainably. And it will be all the better because your customer will be able to look behind the scenes and see all the steps you have taken to fulfil your values.

而企业则应在商业活动和商业决策中充分体现可持续发展的价值观和行动方案，让消费者看到自己的诚信和担当。企业的商业决策应立足于人们的生活，要致力于通过产品和服务优化其生活方式，而不能单纯为了创新而创新。营销的关键是诚信和透明。只要新产品质量上乘、能够切实满足消费者需求，并且采用可持续的开发和生产方式，那么广而告之不仅无可非议，甚至很有必要。因为只有这样，消费者才能看到在产品背后，企业为实现可持续价值观所付出的努力。

### Carbon offsetting

#### 碳抵消

Companies that are unable to eliminate all carbon-emitting activities can purchase carbon credits which offset the amount of carbon they produce. Each carbon credit equals the cancelling out of 1 ton of carbon in the atmosphere. The money raised goes towards mainly agricultural or forestry projects, although a credit can be made by nearly any project that reduces, avoids, destroys or captures emissions. Individuals or companies looking to offset their own greenhouse gas emissions can buy those credits through a middleman or those directly capturing the carbon. In the case of a farmer that plants trees, the landowner gets money; the corporation pays to offset their emissions; and the middleman, if there is one, can earn a profit along the way.

无法彻底消除碳排放的企业可购买碳信用，以抵消自己的碳排放量。每个碳信用额可以抵消一吨被排放到大气中的二氧化碳。大多数能够减少、避免、分解或捕获碳排放的项目均可赚取碳信用额，而碳信用交易筹得的资金主要用于发展农业或林业项目。希望抵消温室气体排放的个人或企业可通过中间商或直接向减排企业购买碳信用额。以农民种树为例，企业可直接向种植户支付碳抵消费用；也可向中间商支付佣金，经由中间商促成交易。

This last point of course is where purchasing carbon credits also demands caution. There are scam schemes waiting to catch out those who don't do their homework, so it's best to look for projects and programmes that are third party verifiable, such as the Verified Carbon Standard (Verra), Gold Standard, Plan Vivo and several others.

在碳信用交易中，最需要引起警惕的正是中间商环节。许多骗局专诿不做功课的人，所以最好选择经过 Verra、Gold Standard、Plan Vivo 等第三方机构验证的项目。

As an example, in the words of Verra CEO David Antonioli, "The three main things that make up the Verra Carbon Standard are: accounting methodologies specific to the project type, independent auditing and a registry system. This is to make sure that both the buyer has confidence that they're buying something that is actually legit, and that the sellers themselves have something valuable." (NBC News).

Verra 首席执行官 David Antonioli 表示：“Verra 碳标准由三大板块构成：因项目而异的核算方法、独立审计和登记系统。这可有效保障买卖双方的利益和交易合法性。”（美国全国广播公司新闻）

## 投机漂绿案例

某投资公司称自己雇佣了农民在农田里植树，由此赚取碳信用额并卖给其他企业。但其中有几个农民表示自己种植的树木已被纳入政府的环保计划。

(彭博新闻社, 2020年12月)

国际足球联合会 (FIFA) 通过购买碳信用来抵消巴西世界杯产生的碳排放，但随后不久，此次碳信用交易中涉及的树木便遭到砍伐。2018年，该项目被叫停，因为砍伐的树木总量已超过售出的碳信用额。

(ProPublica, 2019年5月)

不过，即便企业不在意因漂绿而受到道德谴责，虚假宣传也会招致严重的财务后果，2017年的沃尔玛事件便是前车之鉴。相反，只有将可持续发展纳入企业的核心价值观，才能赢得消费者的长久青睐。

[www.environmentalleader.com/2017/02/greenwashing-costing-walmart-1-million/](http://www.environmentalleader.com/2017/02/greenwashing-costing-walmart-1-million/)

## 06 LETTER TO MY 40 YEAR OLD SELF 凯拉给 40 岁的自己的一封信

Keira Munnely, 10, lives in London with her mum and dad and 8 year-old sibling Jake. She is part of the generation of children that will inherit a climate-changed planet. Many of the commitments made by governments at the Cop26 in Glasgow refer to 2050 as the deadline for achieving their carbon neutrality goals. By then, Keira will have just turned 40. In a letter she is writing to her future self, she expresses what that means to her, and how she sees the future of our planet, in her own words.

Keira Munnely, 10 岁，与她的妈妈和爸爸以及 8 岁的弟弟 Jake 住在伦敦。我们的下一代所继承的，是一个气候变化的星球，而 Keira 正是其中的一员。各国政府在格拉斯哥的 Cop26（即 2021 年联合国气候变迁大会）将 2050 年称为实现碳中和的最后期限，届时 Keira 刚满 40 岁。在给未来的自己写的一封信中，她用自己的语言表达了如何看待我们星球的未来。



**The planet we're leaving to our children, in the eyes of a ten year old.**

**在一个十岁孩子的眼中，我们要留给他们的星球是怎样的呢？**

To 40 year old me,  
致 40 岁时的我：

I am writing this letter in the December of 2021. I am 10 years old and live in the UK. I wonder if that's changed by 2051?



这封信写于 2021 年 12 月。我今年 10 岁，家住在英国。2051 年的时候我的生活会不会变化了呢？

I have some questions and hopes about our environment for the future.

关于未来环境，我心中有一些问题和期待。

Firstly, I wonder if all cars are electric by 2051, because now, lots of electric cars are very expensive, and I think (and hope!) that all or most cars will be electric and cheaper, since there is a lot of pollution at the moment from the fumes that are expelled into our environment.

首先，我想知道到 2051 年，是不是路上跑的都已经是电动汽车了？现在，大部分电动汽车都很贵，我觉得（也希望！）到那时，几乎所有汽车都会是电动的，而且会更便宜。因为现在，汽车尾气大量地排放到空气中，造成了严重的污染。

Next, I wonder what the ocean situation is? At the moment, there is so much plastic in the ocean that lots of sea animals are dying from eating the wrong thing or from getting all caught up in a piece of plastic. At the moment, people are trying to save our sea animals and not do as much fishing.

其次，我想知道海洋的情况如何？现在，海洋中存在大量塑料，许多海洋动物因为误食塑料或被塑料片缠住而死亡。不过，人们正在努力拯救海洋动物并减少过度捕捞。

My third paragraph is about deforestation. People are cutting down the rain forest to put farms on and that releases carbon dioxide. However, many people are trying their hardest to plant new trees and set up a more positive environment.

再者，我想说说森林砍伐。为了建造农场，大量热带雨林被人类砍伐，由此释放出大量的二氧化碳。然而，也有许多人为了建设更美好的自然环境，正积极地植树造林。

Leading on from this, what is your current opinion on zoos? I know it sounds unusual to add this into this letter, so let me explain. Some animals could be majorly endangered, from losing their homes or even being poached, and some of the only animals in these species could be in zoos. I can't tell if this is good or not, because they could have been held captive for their whole life, and might not be able to survive in the wild. On the other hand, they could go back into the wild, reproduce and possibly keep this species alive.

借此机会，我想问问你现在对于动物园的看法。我知道这个问题有点突兀，让我来解释给你听。有一些动物因为失去家园或遭到偷猎，正濒临灭绝，而它们中的最后一批幸存者可能正是在动物园里的那些。我不知道待在动物园对动物来说是好是坏，毕竟它们可能要被圈养一辈子，再也无法去野外生活。但另一方面，如果我们把这些动物放回野外去生存繁殖，那这个物种便能继续生存下去了。

Similarly to the car subject, something better for our environment is solar panels. They are also VERY expensive, but they are much better than wasting electricity that is valuable.

和前面说的汽车问题类似，使用太阳能电池板对环境更友好，但太阳能电池板却很昂贵。可是相比于浪费珍贵的电力来说，这种昂贵也是值得的。

To conclude, I hope the next generation, and the next, and the next, have a future to look

forward to that is sustainable and healthy.

最后，我希望人类所有的子孙后代都能拥有健康、可持续发展的未来。

From Keira Munnelly

Keira Munnelly



*"If we fail to cope with this challenge, all the other problems will pale into insignificance."*  
*H.M. Queen Elizabeth II, quoting her late husband the Duke of Edinburgh,*  
*in her welcome address to Cop26 delegates in Glasgow*  
*"在这一严峻的挑战面前，其他所有的问题都显得微不足道。"*  
*英国女王伊丽莎白二世在第26届联合国气候变化大会上向代表们致欢迎辞时*  
*引用的她已故丈夫爱丁堡公爵的话*

Today we frequently hear the terms 'carbon neutral' and net-zero emissions, but how many of us know what they actually mean? And why are they so important?  
如今，“碳中和”和“净零碳排放”频频出现在我们的视线中，但有多少人理解其真实含义呢？为什么这两个概念如此重要？

In simple terms, carbon neutral means that any carbon dioxide (CO<sub>2</sub>) released into the atmosphere from the activities of individuals or a company is balanced by an equivalent amount being removed. Net-Zero carbon emissions mean that an activity releases no carbon emissions into the atmosphere.

简单来说，碳中和指个人或企业等量抵消因其自身活动而向大气中排放的二氧化碳（CO<sub>2</sub>）。净零碳排放意味着一项活动不会向大气中排放任何二氧化碳。

With the urgent struggle on hand to cut greenhouse gases that are causing a dangerous rise in global temperatures, governments, agencies, companies and individuals are increasingly looking for ways to reduce or offset their carbon footprint. Wholly achieving this is currently a hard ask, but governments and energy agencies are setting targets and implementing actions to encourage or force people to move towards carbon neutral and net-zero in certain sectors within challenging timeframes.

温室气体是全球气温异常上升的主要原因，因此碳减排行动迫在眉睫。政府、组织、企业和

个人正加快寻找能够减少或抵消自身碳足迹的方法。当前，要完全实现碳中和以及净零碳排放还很困难。不过，政府和能源组织已着手制定目标并展开行动，以鼓励或要求人们在有限的时间内，率先在部分领域实现碳中和以及净零碳排放目标。

The world has a viable pathway to building a global energy sector with net-zero emissions in 2050, but it is narrow and requires an unprecedented transformation of how energy is produced, transported and used globally, (IEA Report, May 2021).

要在 2050 年实现全球能源行业净零排放有路可循，但任重道远，需要彻底转变全球能源的生产、运输和使用方式。(国际能源署报告，2021 年 5 月)

### Technology

#### 技术

The Net Zero by 2050 Report by the International Energy Agency underlined that the technology needed to reach net zero is readily achievable. Fatih Birol, the IEA Executive Director said: "These technologies are already invented, but not yet in full development. Innovation is critical, but the technologies are here with us."

国际能源署发布的《2050 年净零排放报告》强调，实现净零排放所需的技术即将问世。国际能源署执行主任法蒂赫·比罗尔 (Fatih Birol) 表示：“这些技术已初具雏形，但尚不成熟。关键是要对现有技术进行创新。”

The crucial new technologies in development are advanced batteries, particularly for use in electric vehicles; hydrogen; and carbon capture. The last of these refers to the process of capturing and storing CO<sub>2</sub> before it is released into the atmosphere.

开发中的关键新技术包括电动汽车用新型电池、氢气和碳捕获。其中，碳捕获是指捕捉并封存二氧化碳，以避免其进入大气层。

### Policy

#### 政策

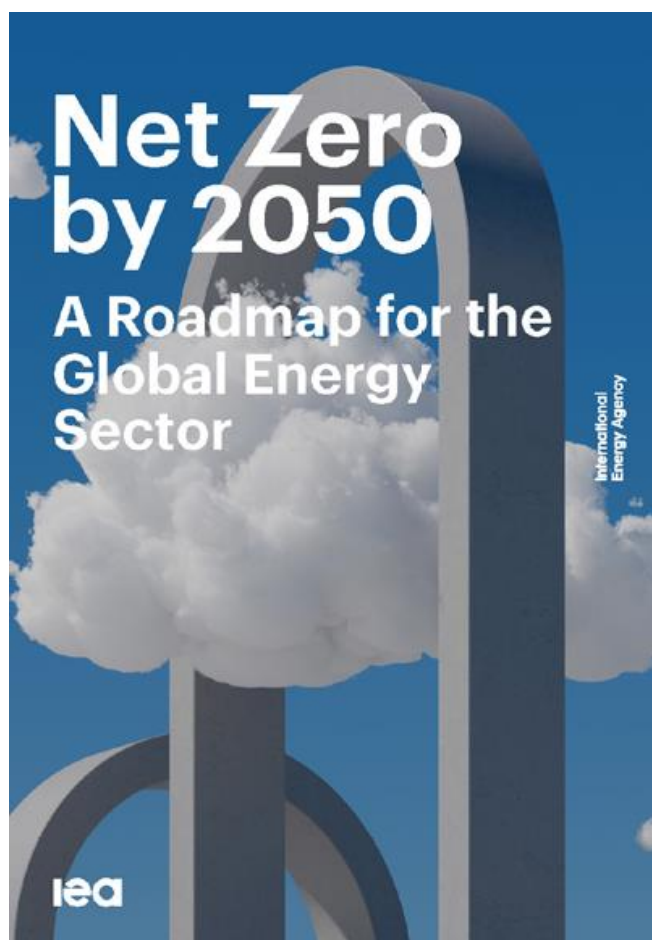
Just one example. At the World Economic Forum in July 2021, ahead of the COP26 meeting in Glasgow in November, EU policymakers outlined ideas on how the bloc's countries can reduce net greenhouse gas emissions by 55% from 1990 levels by 2030, a step towards net zero emissions by 2050. Tighter emission limits for cars will in effect end new petrol and diesel car sales in the EU by 2035.

让我们来直观地看一个例子。2021 年 11 月，第 26 届联合国气候变化大会于格拉斯哥召开。在同年 7 月举办的世界经济论坛上，欧盟领导人提出，为了实现 2050 年的净零排放目标，到 2030 年，各成员国温室气体净排放量要比 1990 年的水平减少 55%。同时，欧盟将出台更严格的汽车限排措施，从 2035 年起全面禁止在欧盟市场销售新的汽油车和柴油车。

Some individual governments are setting even tighter deadlines, with the UK, Germany, Ireland and the Netherlands on course to ban the sale of new cars and vans powered entirely

by petrol and diesel by 2030, and Norway even sooner in 2025.

有一些国家甚至对自己提出了更高的要求。英国、德国、爱尔兰和荷兰将从 2030 年起禁止销售完全由汽油和柴油驱动的新轿车和货车，而挪威将在 2025 年之前达成这一目标。



### Companies 企业

Even looking at everyday activities can bring some surprises when calculating a company's carbon footprint. Using a computer, organising a conference call, or even simply sending an email all add up. It's been calculated that, by 2040, 14% of all greenhouse gases emissions will be due to our digital activities.

计算企业碳足迹时，你会惊讶地发现我们的日常一举一动都在排放二氧化碳。使用电脑、开电话会议，甚至只是发一封邮件，都会增加碳足迹。据计算，到 2040 年，数字化活动所产生的温室气体将占到温室气体排放总量的 14%。

While many companies now are doing their best to reduce their harmful carbon emitting activities by detailed measurement and reorganisation, some emissions are impossible to eliminate, the so-called "irreducible emissions". These need to be dealt with by making sure they are balanced out in some way.

目前许多企业正竭尽全力，期望借助精密测量和架构重组来减少有害的碳排放活动，但仍有一些排放无法杜绝，即所谓的“无法减少的排放”。因此，企业需要通过某些方式来抵消这部

分碳排放。

### Carbon credits

#### 碳信用

Once the impact of a company's activities, or of a single project, in terms of the quantity of CO<sub>2</sub> produced, has been established, it can be balanced out by the acquisition of a corresponding number of "carbon credits". Every carbon credit corresponds to 1 ton of CO<sub>2</sub>. 企业可购买相应数量的“碳信用额”来抵消其经营活动或单个项目所产生的二氧化碳排放。每个碳信用额相当于一吨的二氧化碳排放量。

The credits then fund projects that trap or remove carbon from the atmosphere, such as reforestation, rewilding wetlands, methane capture, creation of windfarms, the installation of solar energy or hydropower.

碳信用交易筹得的资金将用于发展碳捕获和碳清除项目，如重新造林、湿地复原、甲烷捕获、风场建造、太阳能或水电安装。

### Individuals

#### 个人

And what can we as individuals do to live a more carbon neutral life? While the Covid19 pandemic has hugely reduced the opportunities for travel, and given the planet a short moment to breathe cleaner air, many of us are desperate to return to our old ways, both for business and for pleasure. This is a good moment to think about our travel carbon footprint, and maybe reduce the number of times we fly, or find other less polluting ways to travel. And even small daily changes can make a massive difference: eating fewer animal products, shopping locally, driving less, and reducing your waste - it all adds up.

作为个人，我们在生活中应如何推动碳中和？新冠疫情期间，人们外出旅行的机会大幅减少，地球得到了短暂地休养生息。但许多人迫切渴望回到疫情前的工作和生活状态。借此契机，我们应当关注旅行所产生的碳足迹，思考是否应减少搭乘飞机的次数，或改为其他污染较少的出行方式。少吃动物制品、购买当地产品、少开车、减少浪费——即使是日常生活中一点小小的改变，经过日积月累也可能产生巨大影响。

And let's face it, we all know that cutting the amount of time we spend in front of screens is good for our health. It's also good for the planet. The less energy we use, the less carbon gets boosted into the atmosphere.

我们都知道，减少电子产品使用时间对个人健康有益，而这同样对地球有益。我们使用的能源越少，进入大气层的碳就越少。



*“Overall, becoming a carbon-neutral country would involve changes in our behaviour, but these are modest compared with the changes that will be forced upon us if we do nothing.”*

— Caroline Lucas, UK politician

“总的来说，要在国内实现碳中和目标，每个人都需要转变自身行为模式。但比起什么都不做，等到万不得已时再被迫做出的改变，这种转变已相当温和。”

——Caroline Lucas，英国政治家

## 08 SUSTAINABLE PACKAGING 可持续包装

Put simply, sustainable packaging is the sourcing, development, and use of packaging solutions that have minimal environmental impact.

简而言之，可持续包装是指采购、开发和使用对环境危害最小的包装方案。

Ask the older generation about the packaging they remember from their youth and you might be surprised. Cotton or paper bags, sometimes even newspaper, to carry loose produce, simple cardboard boxes for deliveries which were then recycled to pack supermarket shopping, no plastic wrapping or bags, and sheets of padded cotton to protect large items for transportation.

你可能想象不到老一辈人年轻时的包装是什么样的：散装农产品就用棉布袋、纸袋，甚至是报纸盛装；送货时用的是普通的纸板箱，送完货后就把这些纸板箱回收起来，用作超市购物的包装盒；没有塑料包装纸或包装袋；运送大件货物时用棉垫片提供保护。

But in the past 50 years, faster product cycles, global supply chains, new materials, all driven by different and evolving consumer expectations have brought about the mass use of industrial packaging, from tightly wrapped fruit in supermarkets to the shipment of large domestic white goods.

但在过去的 50 年里，由于消费者期望不断变化，因而产品周期不断缩短、供应链呈现全球化趋势并且新材料加速问世。随之而来的，是工业包装的大规模使用。从超市里包装精致的水果到大型白色家电的运输，都离不开工业包装。

But alongside the meteoric growth in the global movement of products needing to arrive protected and undamaged, there is now rising concern about the toll that unsustainable packaging, particularly single-use plastics, is taking on the planet.

为避免货物在运输途中受损，全球范围内越来越多的产品需要层层保护。因此，人们愈发担心不可持续性的包装，尤其是一次性塑料对地球的危害。





According to the "Plastic Waste Makers Index," published by the Australia-based philanthropic Minderoo Foundation, in 2019, 130 million metric tons of single-use plastics were thrown away around the world, with 35% burned, 31% buried in managed landfills and 19% dumped directly on land or into the ocean.

Minderoo 基金会是一家总部位于澳大利亚的慈善机构。根据该机构发布的“塑料垃圾制造者指数”，2019 年全球共丢弃 1.3 亿公吨一次性塑料，其中 35% 被焚烧，31% 进入正规垃圾填埋场，19% 被直接倾倒在陆地上或海洋中。

These figures make scary reading, and unsurprisingly growing numbers of concerned consumers are pressurising legislators and agencies, manufacturers and suppliers, to find others solutions, without losing the undoubted benefits of well-packaged products

这些骇人听闻的数字引起了消费者的广泛担忧，他们随即向立法机构、制造商和供应商施压，要求在不损害产品的前提下，提出其他的包装方案。

*"An average consumer in the western world will handle more than 50 packaged products / items every day." (GWP Group)*

*"在西方世界，一个普通消费者每天要消耗 50 多种包装好的产品或物品。" (GWP 集团)*

### **Reuse, reduce and recycle – the circular economy**

#### **再利用、减量化与再循环——循环经济**

On the frontline of everyday life, campaigns encourage the consumer to buy unpackaged products where possible, use less plastic in the home for food storage, use reusable coffee cups and water bottles, and drink tap or filtered water to avoid single use plastic bottles.

在日常生活中，可通过宣传活动来鼓励消费者更多地购买未包装的产品、在家中减少使用塑料储存食物、使用非一次性的咖啡杯和水瓶，并且尽量饮用自来水或过滤水以减少一次性塑料瓶的使用。

For industrial packaging, much research is taking place to create lighter materials to make transport more efficient and sustainable by reducing weight and thus reducing the carbon footprint of each journey. Attention is also paid in designing the shape of specific packages, thus maximising space to achieve full loads.

目前，工业包装领域开展了大量研究，旨在研发更轻的材料，从而通过减重来提升运输效率和可持续性，减少单次行程产生的碳足迹。此外，研究还发现，通过改变包装的形状，可最大限度地利用空间以实现满载。

There are certainly still many obstacles to overcome. For example, the transportation of fragile goods such as large domestic appliances needs very strong and resilient packaging to protect against impact, vibration and compressive stresses. The most commonly used packaging for this purpose is expanded polystyrene, which can be recovered to be crushed and reused, but currently the recovery rate is low, resulting in the potential for land and ocean pollution. Against the cost to the planet of such pollution, under present circumstances it's necessary to offset the costs that would be involved in less effective packaging, resulting in damaged

products and wasted journeys, a whole chain of carbon emissions for nothing.

当然，仍有许多障碍摆在我们面前。例如，运输大型家用电器等易碎物品时，需要使用高强度、强回弹的包装材料来实现防震缓冲。其中最常见的是发泡聚苯乙烯，这种材料回收后经过粉碎可重新使用，但目前的回收率较低，可能会加重土地和海洋污染。就当前情况而言，如果包装效果不理想，不仅会造成产品损坏，并且运输费用和供应链上各环节的碳排放也将全部白费。比起发泡聚苯乙烯对地球产生的负面影响，包装不当的代价要大得多。



### New ways to pack

#### 新型包装

There are many exciting new biodegradable packaging solutions coming along:

许多新奇的可生物降解包装方案已进入人们的视线：

Plant-based: this is made from biological sources — everything from mushrooms and seaweed to corn and food waste.

植物基：由生物制成，原料包括蘑菇、海藻、玉米、食物垃圾等。

Edible: this also comes from biological sources, going one step further by being safe to eat!

可食用：同样由生物制成，但工艺更先进，制成的包装可放心食用！

Plantable: these have seeds embedded in them, a fun idea for customers. They work well for containing small, lightweight items such as cosmetics or jewellery, and can also be used as fillers or product wraps.

可种植：将种子嵌入包装中，为消费者增添乐趣。适用于包装小而轻的物品，如化妆品或珠宝，也可作为填充物或用来包裹产品。

Compostable and biodegradable plastic alternatives: these are made out of materials that can be composted at home and commercially. They're often made from plant-based polymer that can break down in compost.

可堆肥和可生物降解的塑料替代品：由可用来家庭堆肥或商业堆肥的材料制成。通常由植物基聚合物制成，可通过堆肥工艺分解。

*"The basic idea of packaging is not just to appeal to the consumer, but at the same time ensure that the content inside is intact. Sustainable packaging materials are made up of products that are recyclable and reusable, but they may not be as efficient as plastic and other thicker packaging materials that ensure product safety" (infiniti research)*

*"包装的核心用途不仅仅是吸引消费者，更是要确保里面的物品完好无损。可持续包装材料*

由可回收和可重复使用的材料制成, 但其对产品的保护力度可能不如塑料和其他较厚的包装材料” (Infiniti 调研公司)

### Simplifying and clarifying

#### 清晰的回收指引

Work towards creating monotype plastic bottles for cosmetics and household liquids is urgently underway, as currently the presence of different types of plastic in the bottle itself, the lid and the label makes recycling difficult.

化妆品和家用液体产品所用的塑料瓶瓶身、瓶盖和标签所使用的塑料类型不同, 增加了回收难度。因此, 对这类塑料瓶的统一工作势在必行。

Manufacturers and distributors usually have clearly defined responsibilities for the recycling and disposal of packaging, but clear labelling of packaging for consumers on to how to recycle is an important area for improvement, and depends on interventions by legislators. 根据规定, 制造商和经销商有责任对包装进行回收和处理。为了使消费者更好地参与到包装回收中来, 清晰的包装标签必不可少。但是目前相关法规尚不完善, 还需要立法机构的进一步干预。



So while we rely on our governments, scientists and agencies to push hard and fast for important lasting solutions to these complex problems, let's keep the following in mind for our own day to day 'packaging' lives...

政府、科学界和研究机构正加大力度寻找关键解决方案, 以便一劳永逸地解决这些难题。与此同时, 我们每拆开一个包装时都应提醒自己:

*"There is no such thing as 'away'. When we throw anything away, it must go somewhere."*  
Annie Leonard

“不存在真正意义上的“消失”。任何东西被丢弃后, 只是被弃置在别的地方。”Annie Leonard

### 09 THE MULTIPLE REINCARNATIONS OF THE DOMESTIC REFRIGERATOR: Interview with Fabrizio Longoni 家用冰箱的“轮回”: Fabrizio Longoni 访谈

After a lifetime spent at the service of your everyday sustenance, in the not-so-sad moment of its passing, we take a look at what happens to your fridge once it's been taken away as scrap by the guys who just delivered your brand new Combi.

冰箱终其一生为人们服务，但鲜少有人会因为冰箱的淘汰而伤怀。让我们来看一下当送货员为你运来全新冰箱并把你的旧冰箱当做废品收走以后，它的命运会如何。

We asked Fabrizio Longoni, director general of CDC (Centro di Coordinamento RAEE, Italian clearinghouse organisation for the collection and disposal of electric and electronic waste), to help us assemble the disassembly case.

我们邀请到了废旧电子产品协调中心（Centro di Coordinamento RAEE，一个收集和处理的电气电子垃圾的意大利组织）的总干事 Fabrizio Longoni 来为我们解答。

*“While building a refrigerator is very easy, de-building it, on the contrary, is quite complicated.”*

*“虽然冰箱制造起来不难，但拆解一台冰箱相当复杂。”*



废旧电子产品协调中心总干事 Fabrizio Longoni

What's the principal objective of the end-of-life processing of our appliances?

为什么要对报废的冰箱进行处理？

Let's have a look at the lifecycle of our appliances: we're talking about, in turn, the development of an original idea, the designing of the product, its manufacturing, transport, delivery, usage and subsequently, when the product becomes "waste", its dismantling and disposal in what can be described as a second industrial phase, and one that is particularly complicated, too. This final stage in a product's life has two principal objectives: avoiding the contamination of the environment in the first place, and recycling the materials it's made of in the second place.

冰箱的生命周期按顺序依次是：原始构想的提出、产品设计、制造、运输、交付和使用。当

产品变为“废品”，则需要对其进行拆解和处理，这个步骤尤为复杂，被称为“第二工业阶段”。该阶段的两个主要目标分别是避免污染环境和回收产品原材料。

What's so complicated about taking apart an old appliance?  
为什么说拆解旧冰箱很复杂？

While building a refrigerator is very easy, “de-building” it, on the contrary, is quite difficult. In the production phase, we are dealing with standardised raw materials for standardised processes, while the reverse process, or “de-production”, deals with a variety of models, production years and types of materials, with the objective to obtain usable raw-materials, the so-called secondary raw-materials. This is relatively easily done with metals - scrap yards have been around forever - but becomes a lot more complicated when it comes to all the other types of materials that are involved in the manufacturing of your fridge. After all, it was originally designed and built to preserve food in the best possible way, and less as a future provider of pure-grade secondary raw-materials.

虽然冰箱制造起来不难，但拆解一台冰箱相当复杂。生产阶段所面对的是标准化工艺和标准化原材料，而拆解阶段恰恰相反，需要从型号、生产年份和材质各异的设备中回收可用原材料，即所谓的二级原料。我们对废金属回收站都不陌生，这从侧面反映出金属的回收相对比较容易。但冰箱制造过程中还会用到其他许多类型的材料，其回收难度要比金属大得多。毕竟在冰箱的设计和制造过程中，首先考虑的是如何使食物长效保鲜，而不是如何为后续二级原料的回收提供便利。

What should the ideal, virtuous appliance look like?  
理想的环保型冰箱是什么样的？

Ideally, we would like an appliance to be 100% recyclable, and that the costs involved in recycling it in its entirety, both financially but also in terms of labour, be as sustainable as possible. It's very simple, if the commercial value of these secondary raw-materials is less than what it costs us to extract them from a scrap refrigerator, we probably won't bother doing it, unless someone makes us. Inversely, if the materials extracted are highly valuable and can be turned into cash quite rapidly, these scrap products will be snapped up in no time.

理想情况下，我们希望冰箱 100%可回收，并且将回收所涉及的财务和劳动力成本控制在接受的范围内。这很好理解，如果从废旧冰箱中回收二级原料的商业价值低于所投入的回收成本，那我们可能根本不会去费这个功夫，除非收到了其他单位的委托。相反，如果某批废旧冰箱所含原料价值很高并且可以快速变现，那么很快便会被收购一空。

What recommendations would you make to designers and manufacturers?  
您对设计师和制造商有哪些建议？

If there's one pledge to be made, it would have to be to make simple disassembly and easy recovery of raw-materials part of the design. Moreover, the costs associated to these

operations should be taken into account, alongside traditional costs of production, when calculating the total cost of a product, and eventually reflect on its retail price.

我由衷地希望在设计产品时能考虑拆解便捷性和原材料可回收性。此外，在计算产品总成本时，应将拆解和回收过程中涉及的成本与传统生产成本一并纳入考量，并最终反映在零售价格上。

“The financial and environmental opportunity cost of building a product that is not taking disassembly and recycling into account might turn out to be higher than the savings we can obtain from not investing in the engineering and design efforts to build a virtuous appliance.”  
“如果在制造时完全不考虑拆解和回收，那么该冰箱在财务和环境方面的机会成本可能会比环保型冰箱的设计生产成本还要高。”

So, do designers talk to those in charge of dismantling their creations?

设计师是否会与负责拆解产品的人沟通？

The difficulty is that people who today are working on disassembly and recycling, are dealing with the product of someone's work from 15 or 20 years ago. There's a delay in time, so dialogue is virtually impossible. The real question is “how good is today's designer at foreseeing what will happen in 20 years time?”. The way we build appliances, the materials we employ, do evolve over time, often by small incremental steps, but at times through significant innovation. All this should be taken into account when designing new products.

这件事的难点在于，如今从事拆解和回收工作的人，处理的是 15 年甚至 20 年前某位设计师的作品，这种时间上的延迟导致二者之间几乎无法建立沟通。因此，关键问题是“设计师是否善于站在 20 年后的角度来做预判”。冰箱的制造方式和所用材料均会随着时间的推移而变化，这种变化往往是一点点累积而成的，但其中也不乏重大创新。这些都是在新产品设计时需要考虑的因素。

Would using more metal and less plastics be helpful in some way?

多用金属、少用塑料是否有助于回收工作？

Certainly. The types of plastic that we used some years ago cannot simply be employed today. Nowadays, we are able to better assess the environmental impact of these types of polymers. We wouldn't be allowed to use them for the same purposes. While metals can be recycled more or less infinite times and used in exactly the same way, plastics are far more problematic and become obsolete quite rapidly.

当然。如今，我们已有能力更全面地评估不同塑料对环境的影响，因此不要再一成不变地简单沿用过去使用的那几种塑料。金属可以多次、甚至无限次地回收，并以完全相同的方式再次投入使用，但塑料回收起来更麻烦并且寿命更短。

How does easy-disassembly of the various components affect the recyclability of a product?

配件拆解难度会对产品可回收性产生怎样的影响？

The ultimate goal of the industrial recycling phase is to obtain usable, homogeneous raw-materials, so the easier it is to separate them the better. For what concerns cooling appliances, there are some operations that need to be performed in the first place, starting with making the products “safe”. In particular the compressor and the serpentine must be emptied of all the oil and gases and separated from the rest of the appliance, which is anyway made of a multiplicity of components. The electronics alone are quite intricate and made up of a myriad of elements. The insulation represents a further problem, as it adheres quite strongly to the panels, and contains different types of gases, including pentane, which is highly flammable. Expanding polyurethane with gases such as pentane is easy and cheap when producing the appliance, but it becomes an issue when it comes to its dismantling. Even modern day state-of-the-art insulation represented by VIP Vacuum Insulated Panels do pose some problems for their core is made of either glass fibre or silica. Working in a standardised environment with standardised products and procedures is relatively easy and safe, while having to do with a variety of products of all shapes, ages, and production methods is a completely different ball game.

工业回收阶段的最终目标是获得可用的均质原材料，而且获取难度越小越好。为确保安全性，首先要对冰箱进行处理。尤其是，必须清除压缩机和冷凝管中的所有油分和气体，并将其与冰箱主体分离。冰箱包含诸多配件，仅电路部分就相当复杂，由大量电子元件构成。隔热层牢牢地附着在面板上，内部充斥着各种气体，包括高度易燃的戊烷，因此处理起来也很棘手。戊烷等气体作为便宜便捷的聚氨酯发泡剂，常用于冰箱生产，但拆解起来令人头疼。即使是真空绝热板（VIP）之类的先进绝缘材料也会带来一些问题，因为其芯材主要是玻璃纤维或二氧化硅。相对而言，在标准化环境中，遵照标准化流程生产标准化产品较为简单、也更安全。但面对形状、生产年份、工艺各异的产品，其处理难度大不相同。

What about LED lighting, does that make a difference?

搭载 LED 灯的冰箱是否更好？

It certainly does, but less in terms of energy savings than on the health and safety front which heavily impacts the cost of disposal. Traditional light bulbs contain tungsten, which prevents them from being easily recycled as glass, since it will seriously damage glass foundry furnaces. Even energy-saving fluorescent lights pose a problem since they produce light through a chemical reaction involving mercury vapour. These can represent a serious contamination and health hazard in the disassembly phase. LED lights, in that sense, are much easier to treat, without any risk, and therefore are cheaper to recycle.

没错，不过 LED 灯主要好在能够降低回收处理冰箱时的健康和成本，而非节能。传统灯泡含有钨，会严重损坏玻璃锻造炉，因此回收起来不像普通玻璃那么容易。而节能的荧光灯通过汞蒸汽的化学反应来发光，也不易回收。在拆解时，这些灯可能会造成严重污染并危害健康。从这个层面来说，LED 灯处理难度低并且不存在任何风险，因此可降低回收成本。

What happens to the electronics?

### 电子元件的情况如何？

Nowadays there's an increasing quantity of electronic components in our appliances. A typical motherboard is made up of a very large number of elements, each in very small quantities. These components are simply set aside and dealt with by specialised facilities. There are a few in Europe, but Japan is highly specialised in this field and is literally importing scrap electronic components to extract the rare and valuable elements they contain and re-inject them in the production cycle.

如今，冰箱包含的电子元件数量越来越多。主板通常由种类繁多的元件组成，但每种元件的数量都不多。这些元件被分离出来以后需交由专门机构处理。欧洲设有一些这样的机构，但在该领域专业化程度最高的当数日本。日本能够从进口的废旧电子元件中提取出稀有和有价元件，并将其投入新的生产循环。

Cooling appliances also contain gases...

您刚才说冰箱也含有气体……

That's correct, and similarly to plastic, we have developed and used many types of gases over time. Recycling facilities need to be prepared and equipped to deal with each possible kind of product, some are not legal to use in today's appliances, with the objective to avoid contamination of the environment. At the moment, the geographical areas with the highest quantities of "old" gases in their discarded appliances are Northern European countries or regions with cold climates. Southern Europe or warmer regions have already disposed of almost an entire generation of products containing such gases since cooling appliances tend to have a shorter lifespan in hot climates. Let's also remember that gases are not only contained in the compressor-serpentine system, but also in the insulating materials, from which they need to be "squeezed out".

没错，随着时间的推移，冰箱在制造过程中不仅用到形形色色的塑料，更涉及各式各样的气体。回收机构需具备处理各种材料的能力和设施。在这些材料中，有些因为会对环境造成污染，已被禁止在冰箱中使用。目前，含有“旧”气体的废弃冰箱主要集中在北欧国家或气候寒冷的地区。这是因为气候越炎热，冰箱寿命越短，所以在南欧或其他较温暖的地区，老一代含“旧”气体的冰箱几乎已全部淘汰了。此外，在处理压缩机-冷凝管系统中的气体的同时，也不能忘记把隔热材料中的气体“挤出来”。

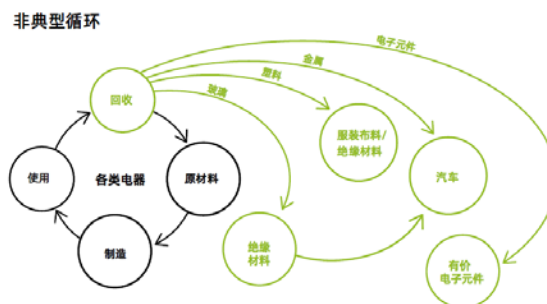




How much of the recycled materials end up in new appliances?  
 有多少回收材料会再用于制造新冰箱？

Apart from steel and copper, which can subsequently also be employed in any industry as a pure-grade material, not much, really, since the industry tends to work on highly standardised processes that depend on standardised raw-materials. But that's not the point, since the purpose of recycling is that these materials do have a new life of some sort. If glass coming from the shelves of a refrigerator cannot be employed in the same role again, perhaps because of unsightly impurities, it may end up as glass fibre in some kind of insulation. Similarly, the shiny transparent plastic of balconies, the immaculate inner lining of the cavity, may find a new life in pile garments or even as an appliance's chassis.

钢和铜回收后纯度依然很高，可再次投入新冰箱的制造。除了这两种材料之外，因为冰箱制造工艺标准化程度高，因而对原材料要求严格，可“原拆原还”的材料种类十分有限。但这不是重点，因为回收旨在为材料赋予某种新生命。从冰箱层架上回收的玻璃可能混有难看的杂质，无法再用于制造层架，但仍可用作隔热材料中的玻璃纤维。还有晶莹剔透的搁架塑料和整洁无暇的箱胆，也能用来制造服装或机壳材料，由此获得“新生”。



How much does it cost to recycle a fridge?

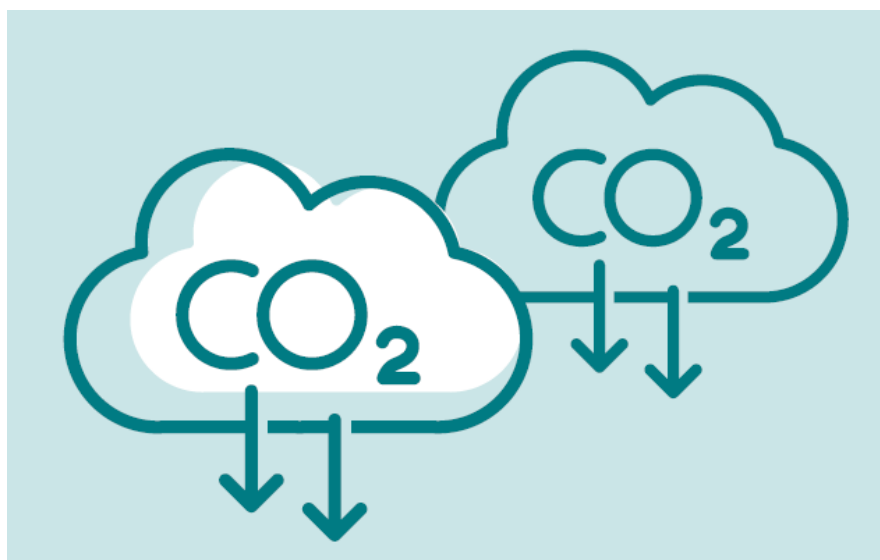
回收一台冰箱的成本是多少？

It's hard to tell precisely since we are dealing with an immense variety of models, sizes, shapes, materials and technologies. The current average figure agreed upon in the industry is around 4% of the cost of production, if we don't consider collection costs from consumer homes to centralised collection points. Even so, logistics still represents the largest part of such cost. With respect to the production, distribution and delivery phases in a product's lifecycle, dismantling and recycling demand a "reverse logistics" approach, whereas, instead of shipping a multitude of products from one single facility to a number of distributors, then to retailers and eventually to consumers, here we are doing the exact contrary: we are collecting products from a multitude of locations and shipping them to a single facility. These products are not even the same size or weight, so you have no way of optimising your transport, hence the heavy impact on costs.

由于每台冰箱的型号、尺寸、形状、材料和所用技术都不相同，所以很难给出准确数字。如果不考虑从消费者家中到集中回收点的成本，目前业内公认的平均回收成本约为生产成本的4%，而物流费用占到其中的大头。在生产、分销和交付阶段，大量产品从同一个地方出发，经由分销商、零售商，最终送到消费者手中；拆解和回收阶段则恰恰相反，我们从不同的地方收集产品，然后将其运往同一个地方，这个过程可以称为“逆向物流”。这些产品的尺寸或重量各异，很难在运输中作出优化，因而会产生高昂的物流成本。

As we kiss good bye to our trusted double-door on its way to a new life, we might be saddened by the fact that we probably won't see it again in our kitchens, but comforted by learning that, in a not-so-distant future, we might be wearing it instead, or keep warm thanks to it, or even drive it! What's important is that it won't end up in a landfill, our oceans or even worse, our atmosphere. In that, designers have a very important role to play in making sure our appliances are ever more recyclable and kind to our planet.

当我们告别用惯了的双门冰箱，看着它踏上新旅途时，可能难免会感到落寞，因为从此厨房里就少了它的身影；但想到在不久的将来，它可能会化身为衣物为我们保暖，甚至成为我们座驾的一部分，心中便宽慰不少。只要它的最终归宿不是垃圾填埋场、海洋、甚至大气层就好。由此看来，在提高冰箱的可回收性和环境友好性方面，设计师发挥着至关重要的作用。



How do we win the global war on carbon emissions? Top down, governments and organisations are attacking this crisis through legislation, economic incentives, community cooperation and information campaigns. And bottom up, individuals and communities are coming up with great ideas.

如何打赢全球减碳战？自上而下来看，全球政府和组织正通过立法、经济激励措施、社区合作和宣传活动来应对气候危机。自下而上来看，个人和社区各界都在为碳减排出谋划策。

First of all, let's take a quick spin around the globe to see how top down initiatives are making a difference.

首先，让我们放眼全球，看看自上而下的方案是如何发挥作用的。

## Energy 能源

According to the International Energy Agency (IEA) Sustainable Development Scenario, energy efficiency represents more than 40% of the emissions abatement we need by 2040. 根据国际能源署（IEA）制定的“可持续发展情景”，到 2040 年，通过提升能源效率，可以完成减排目标的 40%以上。

While many climate activists insist that current and planned legislative solutions to tackle this are not radical enough, governments around the world are starting or continuing to combine regulation and incentives to transform city transport systems, improve the energy efficiency of private and public housing stock, and incentivise carbon neutral or net zero industry innovation. They are driving changes in consumer behaviour by legislation, such as the phasing out of fossil fuel powered vehicles, together with information campaigns and incentives to facilitate these changes.

虽然众多气候活动家坚称已出台的和筹划中的法案力度不够，但各国政府已陆续结合监管和

激励措施来改造城市交通系统、提高私有和公共住房的能源效率，并刺激碳中和或净零产业创新。除此之外，政府还出台法律法规推动消费者行为转变，如逐步淘汰化石燃料汽车，同时通过宣传活动和激励措施来加快转变速度。

### Agriculture

#### 农业

The conundrum facing organisations and governments is how to overhaul food systems and intervene to move agriculture away from carbon-emitting, heavily subsidised, highly industrialised farming methods, towards systems that are less polluting and provide healthy accessible food to the entire global population.

全球政府及组织面临的难题是如何贯彻粮食系统改革，并推动农耕模式从高碳排放、高补贴和高度工业化向低污染转型，从而使健康食物能够惠及全球人口。

A report published in September 2021 by the Food and Agriculture Organisation (FAO), the UN Development Programme (UNDP) and the UN Environment Programme (UNEP) claims that almost 90% of the \$540bn in global subsidies given to farmers every year are “harmful”. 联合国粮食及农业组织（FAO）、联合国开发计划署（UNDP）和联合国环境规划署（UNEP）2021年9月联合发布的报告称，全球每年发放给农民的5400亿美元补贴中，有近90%是“有害的”。

Joy Kim, at UNEP, said: “Agriculture contributes a quarter of greenhouse gas emissions, 70% of biodiversity loss and 80% of deforestation.” The biggest sources of greenhouse gas emissions, such as beef and milk, received the biggest subsidies, the report said. These are often produced by large industrialised groups that are best placed to gain access to subsidies. 来自联合国环境规划署的 Joy Kim 表示：“全球 25% 的温室气体排放、70% 的生物多样性损失和 80% 的森林砍伐与农业有关。”报告指出，最大的温室气体排放源（如牛肉和牛奶生产）获得的补贴却最多。因为这些产品通常由大型工业化集团生产，最容易获得补贴。

In an example of legislative response to such concerns, in November 2021, the European Parliament approved the biggest reform of EU farm subsidies in decades. The new Common Agricultural Policy (CAP) rules, which will apply from 2023, aim to shift money from intensive farming practices to protecting nature, and reduce the 10% of EU greenhouse gases emitted by agriculture.

针对这个问题，欧洲议会已从立法角度展开行动。2021年11月，欧洲议会批准了新的共同农业政策（CAP）改革案，这也是几十年来欧盟农业补贴领域力度最大的一次变革。该政策将从2023年起生效，旨在将资金从集约农业向环境保护转移，并将欧盟农业温室气体排放量降低10%。

The reform will require that 20% of payments to farmers from 2023-2024 be spent on “eco-schemes”, rising to 25% of payments in 2025-2027.

政策还规定，将2023-2024年农业补贴的20%和2025-2027年农业补贴的25%用于“生态计划”。

At least 10% of CAP funds will go to smaller farms and all farmers' payments would be tied to complying with environmental rules.

至少 10% 的 CAP 资金将发放给小型农场，农民获得的款项将与所采取的环保措施挂钩。

### Bottom up

#### 自下而上

Top down is needed, but what about bottom up initiatives? When governments and authorities provide incentives, companies and individuals are spurred on to innovative ideas and new partnerships and behaviours. Let's look at some examples.

自上而下的举措必不可少，那么自下而上呢？政府和组织出台的激励措施带动了企业和个人创新，并催生出新的商业合作和商业行为。让我们来看一些案例。

### Innovative housing refurbishment

#### 创新住宅翻新

In November 2019 in Berlin, the Dena Energy Transition Congress marked the completion of the Energiesprong Volume Deal – in which twenty-two housing companies joined forces to renovate over 10,000 apartments in a climate-friendly and socially responsible manner over the following four years.

2019 年 11 月，德国能源署在柏林举办了能源转型大会。会上，住宅翻新项目 Energiesprong 与 22 家住房公司达成合作，计划在接下来的四年里翻新逾 1 万套公寓，并且会以气候友好的方式进行改造，充分体现企业的社会责任感。

The Energiesprong serial retrofit solution is a digitised and industrialised building process with prefabricated elements that can be used to refurbish buildings in a way that is fast, climate-friendly and tenant-friendly.

Energiesprong 系列改造方案采用预制构件，其翻新速度快、碳排放量少并且对住户的干扰小，成功融合了建筑数字化与工业化。

Energiesprong works internationally and attracts funding through several European projects and through philanthropy.

Energiesprong 的业务范围遍及全球，借助多个欧洲项目和慈善活动来吸引资金。



### Cycling around our cities

#### 城市骑行

The Covid19 pandemic has been a huge game-changer in terms of people's desire to be outside in the fresh air, for safety and for health. As public transport systems closed down or felt unsafe to use, cities around the globe saw a massive rise in demand for safe ways to cycle. This had been a trend pre-pandemic, but the crisis brought about a rapid rise in demand from citizens and solutions from authorities.

人们热衷于前往户外呼吸新鲜空气，但新冠疫情所带来的安全和健康威胁打乱了这一切。部分地区的公共交通系统关闭，加上人们无法再放心地搭乘公共交通，骑行作为安全的出行方式在全球各个城市需求大增。在新冠疫情爆发前，人们对骑行的需求已初露头角，而疫情的出现更是推动了人们的需求增长，并驱使政府尽早给出应对方案。



### Sustainable Scotch whisky

#### 可持续苏格兰威士忌

Bruichladdich is a malt whisky distillery on the Scottish island of Islay. Like its neighbouring distilleries, and many more of Scotland's 134 whisky producers, it relies on fuel oil, brought in

on diesel-powered ferries, to fire the boilers. Islay's nine distilleries burn 15m litres of oil each year.

Bruichladdich 是苏格兰艾莱岛上的一家麦芽威士忌酒厂。与邻近的酿酒厂以及苏格兰其余的 134 家威士忌生产商一样，该酒厂依靠柴油船运送锅炉燃油。艾莱岛上的 9 个酒厂每年要烧掉 1500 万升燃油。

But now the company has challenged itself to reach net zero in its distillation process by 2025. It hopes to pioneer the use of an innovative type of green hydrogen production using green electricity and water electrolysis. For now it is depending on a green tariff, but it plans to use wind and tidal renewables to be installed around the island over the next few years.

但现在，该酒厂决心转型，计划于 2025 年之前实现蒸馏过程的净零排放。它将率先使用绿色电力和水电解技术制备绿色氢气，实现生产过程创新。目前，受制于绿色电力的缺失，该工艺还未能推行。但是在未来的几年内，岛上将安装风力和潮汐发电设备，届时，酒厂将开始使用这些绿色能源。

The hydrogen production technique destined for testing at Bruichladdich has been designed by Protium, a London-based energy firm, with £74,000 in development funding from the UK government, using a US technology. The UK government has set aside £10m for research on helping the UK's whisky and spirits industries go net zero.

这项制氢工艺来自美国，英国政府为其提供了 74000 英镑的研发资金，并由位于伦敦的能源公司 Protium 设计测试方案，最终决定在 Bruichladdich 开展试点。英国政府已拨款 1000 万英镑用于推动国内威士忌和烈酒行业的净零排放研究。

So here's a toast, to every project, big or small... none is too small to be unimportant. 在减碳的进程中，每个项目都至关重要，衷心祝愿每一个项目都马到成功。

*"The greatest threat to our planet is the belief that someone else will save it."*

– Robert Swan, adventurer and environmentalist

*"地球面临的最大的威胁是每个人都觉得环保事不关己。"*

——Robert Swan, 探险家和环保主义者

### 11 CITIES, URBAN HELL OR HEAVEN ON EARTH? 城市，都市地狱还是人间天堂？

*"Typically we don't think of cities as being particularly extreme environments, but few places on earth get as hot as a rooftop or as dry as the corner of a heated living room." (Adam Rogers, science writer)*

*"城市通常不会被视作极端环境，但是地球上仍有少数城市的气候极度炎热或干燥。" (Adam Rogers, 科学作家)*

Over half of the world's population now lives in cities, a figure expected to rise to nearly 70 percent by 2050. Cities cover only about 3 percent of the planet's land, yet they are responsible for 70 percent of global waste, consume almost 80 percent of the world's energy, and produce around 72% of its greenhouse gas emissions.

如今，全球一半以上的人口生活在城市里，预计到 2050 年这个数字将攀升至近 70%。城市仅占地球陆地面积的 3%，但全球约 70% 的垃圾和 72% 的温室气体来自城市。同时，城市还消耗了全球能源的近 80%。

Around the world, from radical new economic models to innovative ideas deriving from citizens, solutions are being discussed and implemented to make the urban environment more green and habitable, reduce air pollution, and grow and deliver better quality food more efficiently.

世界各地正在商讨并推进各类方案，例如采用全新经济模式并实施市民提出的创新理念，以此来打造更绿色宜居的城市、减少空气污染并提高耕种效率和粮食质量。

#### Policy and planning

##### 政策与规划

· The European Commission has agreed on the European Green Deal that aims for a climate-neutral economy by 2050. The deal will promote and showcase 100 European cities to make a systemic transformation towards climate neutrality by 2030, and to make these cities experimentation and innovation hubs for all European cities in the run up to 2050,

· 欧盟委员会已通过《欧洲绿色协议》，提出要在 2050 年之前建成气候中立的经济体系。该协议将推动 100 个欧洲城市在 2030 之年前针对气候中立做出系统性转变，并力争在 2050 年之前把这 100 个城市建设成为欧洲的实验和创新中心。

· In the United States, The Greening America's Communities Program, helps cities and towns develop an implementable vision of environmentally friendly neighborhoods that incorporate innovative green infrastructure and other sustainable design strategies.

· 美国推出了“美国绿色社区”计划，涵盖创新的环保型基础设施和其他可持续设计战略，旨在为城镇绘制切实可行的环境友好型社区蓝图。

· A 2015 report from the Asian Development Bank states that by 2025, there will be 21 megacities in Asia. Already in the poorest of existing cities, infrastructure supply lags behind



demand, and basic public services such as water connections and solid waste disposal do not reach the majority. In addition, many residents live on marginal lands where they face risks from flooding, disease and other shocks.

· 2015 年亚洲开发银行的报告指出，到 2025 年，亚洲将有 21 个特大城市。在当前最贫困的城市中，基础设施供不应求，基本的公共服务（如自来水和固体废物处理）无法覆盖大部分人口。此外，许多人生活在城市边缘地带，随时面临着洪水、疾病和其他威胁。

The report outlines steps to:

- develop cities that recycle, manage waste in innovative ways and use renewable energy resources.
- include mechanisms for people to affect the decisions being made about how their city is developed and managed.
- build in resilience to disasters and other shocks
- plan city developments that incorporate cultural heritage and history
- develop green space and walkability, moving away from vehicle centred spaces

该报告概述了以下措施的行动步骤：

- 在城市中发展创新的垃圾回收管理方法，并且多用可再生能源。
- 建立民意反映机制，在城市发展和管理过程中倾听市民的声音。
- 建立抵御灾害和其他危机的能力。
- 将历史文化遗产纳入城市的发展规划。
- 打造适宜步行的绿色空间，摒弃以车辆为中心的道路规划方式。

· The United Nations Food and Agriculture Organisation (FAO) Green Cities initiative focuses on promoting innovation for resilient green spaces and sustainable urban agriculture for large, medium and small cities in the developing world.

· 联合国粮食及农业组织（FAO）提出的“绿色城市”倡议强调在发展中国家的大、中、小型城市构建富有活力的新型绿色空间和创新型可持续都市农业。

## Colombia

### 哥伦比亚

In Medellin, Colombia, the FAO has supported the departments of Nariño, Antioquia and Boyacá to build community gardens. More than 7 500 families have benefitted from these gardens, allowing them to grow their own food with the possibility of selling the surplus.

在哥伦比亚麦德林，联合国粮食及农业组织支持在纳里尼奥省、安蒂奥基亚省和博亚卡省建设社区菜园。7500 多个家庭从中获益，他们可以自己种植粮食并将剩余的出售。



## The Netherlands 荷兰

In April 2020, the municipality of Amsterdam formally adopted a radical new economic model as the starting point for public policy decisions, the first city in the world to make such a commitment. The central premise of the so-called 'doughnut model' devised by British economist Kate Raworth, is that the goal of economic activity should be about meeting the core needs of all, but within the means of the planet. Rather than aiming for never-ending growth, the emphasis is on thriving with an inter-connected and balanced wellbeing across all areas, from the individual to the planet.

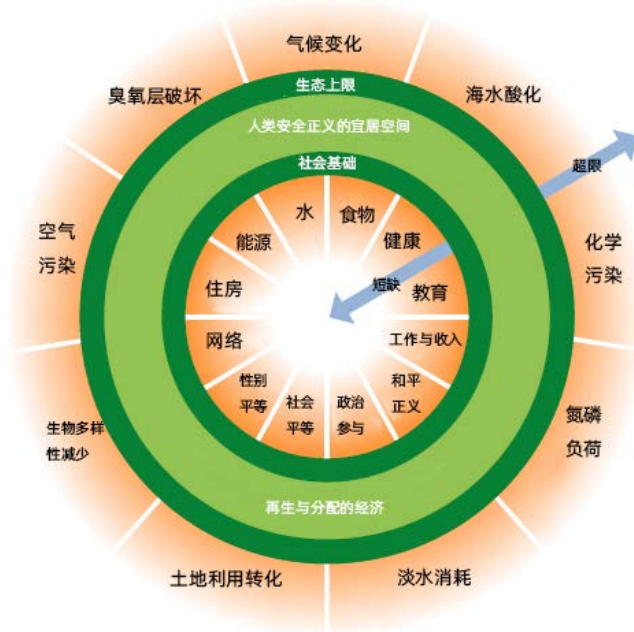
2020年4月，阿姆斯特丹市政府正式将“甜甜圈模式”作为公共政策的决策依据，由此成为全球首个采用这种全新经济模式的城市。“甜甜圈模式”由英国经济学家 Kate Raworth 提出，其重要前提是，在不破坏地球环境的情况下，通过经济活动满足所有人的核心需求。该模式强调从个人到地球，在各领域实现均衡有序的共同繁荣，而非追求无止境的增长。

With a housing crisis to manage, Amsterdam aims to use the model as it makes future planning and building decisions, and more widely, in all areas of future development and investment choices.

为解决住房危机，阿姆斯特丹计划将该模式应用于未来的规划和建筑决策中，并在未来逐步推广到发展和投资的各个领域。

Also in The Netherlands, a simple but incredibly effective way of re-greening has been dreamt up. In the Amsterdamse Bos, a forest on the outskirts of the Dutch capital, volunteers have collected thousands of saplings cleared from woodland paths, and have transplanted them to a local tree hub. From there they can be given away free to farmers, councils and landowners. This circular forest management saves trees that would otherwise be discarded and contributes to the ambitious Dutch tree-planting target of 37,000 hectares, about 100m trees. There are plans to scale the scheme up.

除此之外，荷兰还孕育出一个简单但效果显著的“植树造绿”方案。阿姆斯特丹森林公园坐落于荷兰首都阿姆斯特丹的郊区。志愿者从这里的林间小路中清理出数千棵树苗，并将其集中移植到当地的一个种植中心。种植中心会将树苗免费分发给农民、社会团体和土地所有者。这种循环式森林管理模式不仅挽救了本会遭到丢弃的树苗，还能帮助荷兰实现植树 37000 公顷的宏伟目标——相当于要种 1 亿棵树。此外，荷兰还打算扩大该项目的规模。



## Italy 意大利

Milan has a target of 3 million trees planted by 2030. This approximately 30 percent increase in the city's trees has the potential to absorb 5 million tons of carbon dioxide every year while reducing PM10 small particles by 3,000 tons in the next eight years. This pollutant is responsible for respiratory disorders and has been linked to higher risks of cancer. And with the arrival of Covid19, the need for clean fresh air has become even more urgent.

米兰计划在 2030 年之前种植 300 万棵树。届时，米兰的树木数量将增加约 30%，每年有望吸收 500 万吨二氧化碳。在 2030 年之后的八年里，米兰的 PM10 颗粒物会减少 3000 吨。PM10 污染物是导致呼吸系统疾病的元凶，并且会增加患癌症的风险。新冠疫情爆发之后，人们迫切渴望能呼吸到干净新鲜的空气。

The city authorities plan 20 new urban parks, while extending existing ones and transforming areas such as an abandoned freight railway network. Trees will also be planted in more than 2,000 schoolyards and in private gardens, and greenery will be also planted on flat rooftops, with 10 million square meters already fit for the project.

米兰市政府计划新建 20 个城市公园并扩建现有公园，同时改造货运铁路网络等废弃区域。

除此之外，还将在 2000 多所学校的操场和私人花园中种植树木，在面积达 1000 万平方米的平坦屋顶上种植绿植。

The most eye-catching and famous of Milan's re-greening efforts is architect Stefano Boeri's Vertical Forest, two residential tower blocks in the city centre featuring 800 trees, 15,000 plants and 4,500 shrubs covering every balcony. Since their construction in 2014, the towers have attracted more than 20 species of birds and can absorb 30 metric tons of carbon dioxide every year.

在米兰的各项植树造林行动中，最亮眼、最著名的要数建筑师 Stefano Boeri 设计的“垂直森林”——两幢位于市中心的住宅塔楼，楼体上共种植了 800 棵树、15000 株植物和 4500 株灌木，覆盖每个阳台。自 2014 年建成以来，“垂直森林”已吸引 20 多种鸟类在此栖息，每年可吸收 30 公吨二氧化碳。



As our cities grow, so does our need for ingenious solutions to turn them from hell to heaven, from urban jungle to healthy, clean communities, able to sustain themselves and the planet, while providing a thriving future for new generations.

城市的发展离不开新颖巧妙的可持续发展方案。只有这样，才能将其从都市地狱转变成人间天堂，同时把城市从钢筋森林建设成为健康清洁的家园，从而持续推动地球发展并为后人留下欣欣向荣的都市景象。

Have you ever thought about what materials go into making your Smartphone so smart?  
你是否想过是什么材料让智能手机变得如此智能？

There is a surprisingly large mix of metals in any given smartphone, from copper, silver and gold for conductivity, to indium-tin oxide for touch screens, to lithium for the batteries, through a whole array of rare earth metals (REEs) bringing colour, clarity and sound to your devices.

每台智能手机都由大量各类金属构成：金、银和铜用于导电，氧化铟锡用于制造触摸屏，锂用于制造电池，还有多种稀土金属（REE）可使手机色彩鲜艳、线条流畅、声音清晰。

These precious ingredients, defined as Critical Raw Materials (CRMs), are not only used for these vital accompaniments to our daily lives, but also in the clean green technologies that are crucial for moving to a carbon neutral or net zero society as we tackle climate change.

这些珍贵成分被定义为关键原材料（CRM），不仅能用于制造日常用品，更可用于发展清洁绿色技术。为应对气候变化，需推进碳中和以及净零社会建设，而绿色技术在这个过程中起着至关重要的作用。

For example, lithium also powers the batteries of electric vehicles, platinum integrates the production cycle of green hydrogen, and silicon is used in the production of photovoltaic panels.

例如，锂能够用于制造电动汽车的电池，铂金在绿氢制备中必不可少，而硅则可用于生产光伏板。



为了探究智能手机的构成，普利茅斯大学的科研人员将一部智能手机扔进了搅拌机。经过对手机粉末的分析，他们发现了铁、硅等常见金属元素，钴之类的稀有金属元素，以及钕（160毫克/0.00565盎司）、镨（30毫克/0.00106盎司）等稀土元素。实验表明，手机中银的含量约为90毫克/0.00318盎司，金的含量约为36毫克/0.00127盎司。这相当于，每年生产的15亿部智能手机中含有大约430万盎司的银和170万盎司的金。

So how and from where are these CRMs obtained? Many of them are mined in countries with the potential to become unstable politically, where the rights of indigeneous groups and their traditional environment can clash with the industry, where there may be few workers' rights in the mines, or where the supply chain is long and complex from mine to manufacture.

那么，如何以及从哪里获得这些关键原材料呢？其中有很大一部分开采自政局前景混沌的国家。然而，开采工作会损害当地群体的权益并破坏原有环境，矿区工人的权利往往得不到保障，并且从开采到制造的整条供应链漫长而复杂。

These factors have resulted in various ongoing actions by the European Commission (EC) to reduce Europe's CRM dependency on third countries, diversifying supply from both primary and secondary sources and improving resource efficiency and circularity, while promoting responsible sourcing worldwide.

基于以上原因，欧盟委员会 (EC) 采取了一系列行动来减少欧洲对第三国的关键原材料依赖，力争能源供应多样化，从而提高资源效率、推动资源循环，并在全球范围内推广负责任采购。

In September 2020, as the EC presented its Action Plan on Critical Raw Materials, Maroš Šefčovič, Vice-President for Inter-institutional Relations and Foresight said: "A secure and sustainable supply of raw materials is a prerequisite for a resilient economy. For e-car batteries and energy storage alone, Europe will for instance need up to 18 times more lithium by 2030 and up to 60 times more by 2050. ... we cannot allow ourselves to replace current reliance on fossil fuels with dependency on critical raw materials. This has been magnified by the coronavirus disruptions in our strategic value chains. We will therefore build a strong alliance to collectively shift from high dependency to diversified, sustainable and socially-responsible sourcing, circularity and innovation".

2020年9月，欧盟委员会发布《关键原材料行动计划》，负责机构间关系和展望事务的副主席 Maroš Šefčovič 表示：“对于富有弹性的经济体来说，安全、可持续的原材料供应必不可少。单就电动汽车电池和储能而言，到2030年，欧洲的锂需求量将增加到18倍，到2050年将增加到60倍。单纯地从依赖化石燃料转向依赖关键原材料是行不通的。由于新冠疫情破坏了我们的战略价值链，这一问题显得更加突出。因此，我们要紧密合作，共同摆脱对外高度依赖的局面，加速构建多样化、可持续并且有社会责任感的采购、循环和创新模式。”

What does this mean in practice? Currently, EU countries only supply small amounts of key critical raw materials needed in strategic sectors like wind power, batteries, robotics and photovoltaic. Giving a greater push to the recovery of CRM from electronic devices is one important solution, but in the words of Hildegard Bentele, Member of European Parliament (MEP) and author of the Report on the European Strategy for Critical Raw Materials, "There is no doubt about the potential of recycling and other elements of the circular economy. But let's not turn a blind eye to the continuing need for primary raw materials. Sustainable sourcing in the EU is part of the solution."这在实践中意味着什么？目前，欧盟成员国只能为风能、电池、机器人、光伏等战略部门供应少量关键原材料。为此，加大电子设备中关键原材料的回收力度势在必行。不过，欧洲议会议员、《欧洲关键原材料战略报告》作者 Hildegard Bentele 认为：“资源回收和循环经济的其他要素的潜力毋庸置疑，但针对主要原材料的长期需求也不容忽视，因此可在欧盟市场采用可持续采购策略。”

To meet this need for sustainable sourcing, among other actions, the EC:

- has established a European Raw Materials Alliance to bring together all relevant stakeholders
- is working with Member States and regions to identify mining and processing projects in the EU that can be operational by 2025. A special focus will be on coal-mining regions and other regions in transition, with special attention to expertise and skills relevant for mining, extraction and processing of raw materials
- will promote the use of its earth-observation programme Copernicus to improve resource exploration, operations and post-closure environmental management.

为满足可持续采购的需求，欧盟委员会还采取了以下行动：

- 成立欧洲原材料联盟，将所有利益相关者聚集起来。
- 与成员国共同敲定可在 2025 年之前投入运营的欧盟采矿和加工项目。把重点放在煤矿地区和其他转型地区，特别关注原材料开采、提取和加工方面的专业知识和技能。
- 将扩大地球观测计划“哥白尼”的应用范围，从而优化资源勘探、资源运营和矿场关闭后的环境管理。

And what about recycling? A recent statement by European People's Party MEPs said “The industrial processes of recycling of critical raw materials still require substantial investments in collection and recovery infrastructures, in innovation and in the expansion of technologies, as well as in skills...,” while noting that the national plans of EU states did not adequately meet these requirements. With the notable exception of Italy, whose National Plan of Recovery and Resilience provides 150 million euro for the financing of innovative systems for the recovery of CRMs from discarded electric and electronic devices.

关键原材料的回收利用情况如何？欧洲人民党议员在最近的一份声明中表示，关键原材料的工业回收流程要求政府在回收基础设施、技术创新与推广、专业技能等方面加大投资。同时还指出，欧盟各成员国的计划未能完全符合以上要求。不过意大利是一个例外，其“恢复与复原计划”拨款 1.5 亿欧元用于建设创新体系，以便从废弃的电气电子设备中回收关键原材料。

### **So what can we do to help?**

#### **为此我们能做些什么？**

Research by UK campaign group Material Focus estimated that in 2021 5m unwanted electrical items would be thrown away or hoarded after being supplanted by purchases made between Black Friday and Christmas.

据英国材料运动组织 Material Focus 的研究估计，2021 年的黑色星期五和圣诞节过后，将有 500 万件电子产品被新购入的设备取代，随之遭到丢弃或被闲置。

The estimates, based on a survey of 2,000 adults, point to at least 2.7m older unwanted electrical items being sent to landfill and a further 2.2m being forgotten at home.

Material Focus 对 2000 名成年人进行了调查，发现至少有 270 万件旧电子产品被送进垃圾填埋场，还有 220 万件被束之高阁。

Britain's e-waste problem is likely to be replicated worldwide, with analysts estimating that millions of new mobile phones would be bought in the wake of Black Friday, spurred by the latest iPhone launch.

类似的电子垃圾问题不仅发生在英国，更遍布全球各个国家。据分析人士估计，黑色星期五之后，随着新款手机发售，人们将购入数百万部新手机。

So if you have to buy a new device, look for somewhere to donate the old one. Find out what the electronics recycling situation is like where you live, and speak to the authorities if it's not adequate. And search round in the drawers for those old phones – who knows how much silver and gold you're hoarding!

因此，如果你必须要购买一台新手机，那就找个地方捐掉旧手机。查阅你所在地区的电子产品回收政策，如果信息不足，可以向监管机构反映。还可以去抽屉里翻找你用过的旧手机，里面可含有不少真金白银！



### 13 THE GREEN EYE OF THE DESIGNER 设计师的绿色眼光

Patrizio Cionfoli, director of design and interaction at Studio Volpi, shares his perspective on how the climate change debate is influencing the way household appliances are designed. 气候问题会对家用电器的设计产生怎样的影响？对此 Volpi 工作室的设计与交互总监 Patrizio Cionfoli 分享了他的看法。



How did the designer's job change over the past few years, in the light of the public's growing sensitivity towards environmental issues?

在过去的几年里，公众对环境问题越来越敏感，设计师的工作由此发生了哪些变化？

There have been changes in technology, but also cultural and lifestyle changes. Instead of an ever increasing level of globalisation, we have been witnessing the return to a more local outlook in terms of design. We now have different approaches when it comes to designing products for the different regions. We have changed the way we design products compared to twenty years ago, when globalisation was a must. Also, nowadays, green issues drive the development of new products. It all depends on what we can achieve with the help of technology. For starters it can help us design more energy-efficient appliances, but it can also guide consumers in using them more effectively and, in the case of refrigerators, minimise food waste by prolonging the “window of opportunity” for food to be used before it spoils. 设计的变化会发生在技术层面，不过从文化和生活方式角度来看，设计也与过去不同了。设计不再聚焦于日益增强的全球化趋势，而是回归本地化视野。二十年前，产品设计必须以全

球化为导向，而如今时移世易，我们会针对不同地区采用不同的产品设计方法。此外，如今环境问题已成为新产品开发的驱动力，而技术则决定了产品的最终形态。首先，技术可提升产品能效，也能引导消费者高效使用电器。就冰箱而言，通过延长食物保鲜时间可最大限度地减少食物浪费。

Appliance-technology has also learned to adapt to different types of user profiles, be they beginners, intermediate or proficient. This advanced personalisation further helps consumers in using their appliances in the best possible way. A lot of attention is also paid to the types of materials used in the manufacturing of any new product. In the past these aspects tended to be overlooked, and some of the materials used at the time wouldn't be considered acceptable today in the light of our current environmental policies. We must not generalise, though, and must not think that, say, all plastic should be banned. Single-use, disposable items like the plastic bottles that get thrown away just about anywhere are the real villains here. We have to consider the entire lifecycle of appliances, and make sure we can recycle as much of their components as we can, including the high-quality plastic they contain, which can greatly contribute to this virtuous circle. This changed the way we design appliances, since we now plan for their recycling right from the drawing board.

得益于技术，如今的电器能够针对不同类型的消费者提供相应的个性化方案，无论是新手用户、中级用户还是专家用户都能获得满意的使用体验。我们同样高度关注新产品制造过程中所用的材料类型，而过去，产品原材料往往不受重视。此外，根据目前的环境政策，有些过去使用的材料已被禁用。但是我们要避免一刀切，比如不能禁用所有塑料。一次性用品，如随处可见的废弃塑料瓶，才是导致环境问题的元凶。在设计时，我们要考虑到电器的整个生命周期，以提高配件和高质量塑料的回收率，从而大力推进材料的良性循环。这改变了电器的设计方式，因为设计师现在从画图纸开始，就要对产品回收作出规划。

“

如今，设计师是企业文化变革的推动者。

Patrizio Cionfoli

Can the designer really make a difference?

设计师真的能够推动变革吗？

The role of the designer will increasingly become that of an agent of cultural change within an organisation. By definition, designers work with their minds set onto the future, and what they're working on today will actually be on the market in a few years. Design goes well beyond the technical aspects of a product. Design-thinking is more of a cultural approach, and starts with identifying needs and challenges, and transforming them into opportunities. Eventually, these opportunities become real products, commonplace objects used by consumers around the world. The ultimate objective being, of course, making our lives better. 设计师将逐渐承担起推动企业文化变革的职责。设计师的工作着眼于未来，他们当前所设计的产品几年后才会面世，因此设计时要考虑的远不止产品技术层面的内容。设计思维更像是一种文化取向，首先要识别消费者的需求和痛点，然后将其转变为机遇。最终，这些机遇将化身成为实实在在的产品，销往世界各地，服务于人们的日常生活。当然，设计的最终目的是让人们的生活更美好。

So was the change more a matter of technology-push, or was it demand-pulled?

那么设计方式的变化是由技术推动的还是由需求拉动的？

Definitely demand-pulled. It's always the markets that give off signals that we need to interpret in order to identify consumers' needs. Consumers themselves often don't really precisely know what the actual solutions might be, as they generally express an undefined aspiration or simply raise an issue, so it's up to us to come up with an answer. Technology, far from creating or pushing a need, is an enabler. It helps us define the most appropriate response to the latent needs. When it comes to environmental issues, if a few years ago a company could get away with greenwash, i.e. talking green but doing very little about it, nowadays social media have made it virtually impossible, as any inappropriate behaviour, or simply the non-respect of sustainability promises, will inevitably and quite rapidly be exposed. Any claim about a company's sustainability or green practices can be almost instantly checked. If on one hand this greatly discouraged greenwash, on the other hand it encouraged companies to be more open and do more about sustainability in terms of processes and products.

肯定是由需求拉动的。市场会释放信号，而我们需要通过解读这些信号来识别消费者需求。消费者往往无法准确描述自己想要怎样的解决方案，他们通常只提出了一个模糊的期望或痛点，而设计师要做的就是为消费者排忧解难。技术既不会创造需求也不会推动需求，而是在需求的满足过程中起到催化作用，帮助我们对潜在需求作出最合适的反应。针对环境问题，如果是在几年前，企业还有可能在漂绿（即喊口号式的可持续态度）后侥幸逃脱处罚。但现在，社交媒体让所有的不当行为无所遁形，任何违背可持续发展理念承诺的做法都将被迅速曝光，无一能够幸免。毫不夸张地说，消费者如今几乎能够第一时间验证企业就可持续发展或环保实践作出的声明是真是假。这不仅极大地遏制了漂绿行为，同时也鼓励企业打开思路，在工艺和产品方面实现更强的可持续性。



Consumers are still confused about what food items should be kept in the fridge, and which ones should stay out.

消费者仍不太清楚哪些食物适合放进冰箱，哪些不适合。

What about refrigerators? Have they changed over the past years? They seem to have taken on an important social role in consumers' lives. How does that reflect in the way they are designed?

那么在过去的几年里，冰箱是否发生了什么变化？冰箱似乎已成为了消费者生活中不可或缺的一部分，这对冰箱设计是否有影响？

In the 1980's consumers would tend to buy food supplies that would last, on average, for several weeks. Refrigerators and freezers were bulk storage devices. Since then, consumption patterns have progressively and steadily evolved towards more frequent shopping trips, with more and more fresh produce. Today, refrigerators reflect this generalised trend. What we're still missing is the knowledge, on the part of consumers, of how to properly store food, what food items should be kept in the fridge and which ones are better be left out of it. So much so there is talk of designing smart refrigerator shelves that would help consumers stock up in the right way, with every product in its place.

20 世纪 80 年代，消费者平均每次采购都会买上够吃几个星期的食物，因此为了储存这些食物，冰箱和冷柜的尺寸都设计得很大。但在那之后，消费模式逐渐变化，人们倾向于提高采购频率，以便吃到新鲜食物。如今的冰箱正是迎合了消费者的这一普遍需求趋势。但冰箱相关知识在消费者中的普及程度还不够高，消费者仍不清楚应如何正确地保存食物、哪些食物适合放进冰箱，而哪些不适合。为此，有人提出了智能冰箱层架的概念，为每件产品预设好固定位置，从而帮助消费者正确储存食物。

One of the effects of lockdown was that people started using online shopping and delivery services like never before, since they could not physically travel long distances to go shopping

at their usual center stores. As a result, shopping frequency increased, but so have trips to proximity, smaller food stores, to the extent that many people have now taken to shopping on a daily basis from local mom and pop style grocery stores.

疫情封锁期间，人们无法再大老远赶往常去的购物中心，于是开始尝试网上订购、配送到家的服务。由此，人们的购物频率增加了，同时，他们前往附近小型食品商店的次数也增加了，许多人甚至每天都会去家庭式杂货铺购物。

In the light of these emerging shopping habits, one would expect the size of refrigerators to shrink, since there is no longer a need for all that storage space. On the contrary, demand for large fridge-freezers is on the upside. An apparent paradox, since the size of houses also tends to be on a downward trend. In fact, it is the new cultural and social role the refrigerator has taken on as a status symbol that explains the high demand for extra large appliances. Cooking is now a central part of our social life and the fridge is the centrepiece of every kitchen, hence the importance of size, and also of aesthetics and detailing.

随着这些新购物习惯的产生，人们所需的存储空间变少了，鉴于此，我们可能会认为冰箱尺寸也该相应缩小。而事实恰恰相反，人们对大型冰箱的需求仍在增长。这显然不合逻辑，因为人们的住房面积也在缩小。其实如今的冰箱已成为身份地位的象征，承担起新的文化和社会功能，这也正是消费者倾向于购买超大型冰箱的原因。当前，烹饪是社交生活的核心之一，而冰箱作为厨房中的重要电器，其尺寸、外观和做工就显得尤为重要。

In the future, awareness about correct food preservation practices might bring about a new type of appliance, something halfway between a wine cellar and a larder, where we would keep fresh produce needing a cool and dry storage place away from direct sunlight. In the meanwhile, we might as well start re-thinking the way we stock our fridge, as we may have done it wrong our whole life!

未来，随着人们逐渐认识到正确的食物保鲜方法，一种新的电器可能会应运而生。它兼具酒窖和储藏室的特性，可为新鲜食材提供阴凉、干燥和避光的保存环境。与此同时，不妨反思一下自己往冰箱里塞东西的方式，因为我们很有可能一直以来都做错了！

### 14 DO'S AND DON'TS OF THE FRIDGE 冰箱使用注意事项

While industry can achieve a lot in terms of sustainability, the last mile is entirely up to consumers, and the way they use appliances in their own homes.

在可持续发展进程中，工业功不可没，但可持续理念的最终实现还有赖于消费者及其在家中使用电器的方式。

Using a refrigerator would seem to be the easiest and most natural thing in the world to the vast majority of us. Yet a conscious and at times different use of the most important appliance in our kitchens could help to make the difference for the environment.

对绝大多数人来说，使用冰箱似乎是世界上最简单、最自然的事。冰箱是厨房中使用率最高的电器，通过有意识地改变我们使用冰箱的方式，有望为环保事业添砖加瓦。



### FOOD WASTE AND ENERGY CHALLENGES

#### 食物浪费与能源危机

Waste and energy consumption are the two fronts the battle for fridge sustainability is fought on. The correct preservation of our food, in the sense of it not going off before we have a chance of consuming it, will help keep food waste down, and as a consequence we could be saving on the resources needed to produce it, like water, energy, soil and transportation. On the other hand, making sure our fridge doesn't consume too much energy will help save on carbon emissions.

要提高冰箱的可持续性，可以从食物浪费和能源消耗两方面入手。食物如果保鲜得当，可以降低还没来得及吃就变坏的几率，有助于减少浪费，进而节省食物生产过程中消耗的水、电、土壤、运输等资源；而降低冰箱能耗则有助于削减碳排放。

Our fridge can serve as the pivot point of our domestic food waste and energy consumption

reduction strategy. It all comes down to the way we load it and the way we manage fresh produce and leftovers.

因此, 为了减少食物浪费和能源消耗, 应以冰箱为切入点制定策略, 并最终落实到食物摆放、新鲜食材管理和剩菜处理的方式上。

### LOAD THE STUFF RIGHT

#### 正确地摆放食物

When it comes to loading our shopping into the family fridge, we don't really think there's a right or wrong way of doing it, as long as it makes sense to us. But in fact it does make a difference. Placing the most used items at the front of the shelves, and also the most perishable ones, will help us "see" them better every time we open the fridge. This will help us avoid spending ages searching with the door open, which would cause the motor to work harder to maintain temperature, consuming more electricity. Also, if perishable produce is hidden at the back, it might be too late once we finally realise it's been sitting there all that time, so having it constantly under our eyes might avoid it being thrown away.

说到把食物摆放进家里的冰箱, 人们通常认为怎么放都行, 只要按着自己的习惯来即可。但实际上怎么摆放是有讲究的。把最常用、最易腐烂的食物放在层架最前面, 这样每次打开冰箱都能第一眼看到, 从而避免长时间开着冰箱门翻找东西。要知道, 冰箱门开着的时候, 为保持内部温度恒定, 电机转速会加快、耗电更多。而如果把易腐的食物放在后面, 等我们再想起来时, 这些食物可能已经变质了。因此把它们放在视线范围内, 将有助于减少浪费。

The impact of food waste in terms of cost to the environment is simply mind boggling, and every little improvement can make a huge difference. According to the European Food Information Council, in 2019 more than 930 million tonnes of food waste were generated, of which roughly 60% came from households. Throwing away that single wrinkled tomato we forgot at the bottom of the fridge costs the environment about 125 litres of water and 300 g carbon emissions.

就环境成本而言, 食物浪费对环境造成的影响令人瞠目结舌, 但每一点细微改进都可能带来巨大变化。根据欧洲食品信息委员会的数据, 2019年产生的食物垃圾高达9.3亿吨, 其中大约60%来自家庭。扔掉被遗忘在冰箱底部的那个皱巴巴的番茄, 会消耗环境中约125升水并释放300克碳。

Wrapping certain items, or boxing them will help prolong their life, with better chances of us eating them before they spoil. Typically, cheeses should be wrapped in their specific paper, eggs, if at all kept in the fridge, should be left in their cartons to avoid picking up unwanted odours. Also, producers have developed differentiated temperature and humidity storage zones that are best adapted to different food types. Storing food correctly in these dedicated areas certainly helps better preserve it, greatly reducing waste.

把某些食物包裹起来或装进盒子, 可延长保鲜时间, 从而让人们在其变质之前有更充裕的时间来将其吃掉。通常情况下, 应使用专用包装纸把奶酪包裹起来; 如果要把鸡蛋放进冰箱保存, 最好连着包装盒一起放进去, 这样可以避免沾染异味。此外, 生产商还开发了不同温度和湿度的储存区, 可满足不同食物的保鲜需求。将食物正确地摆放在专用区域无疑可延长保

鲜时间，从而有效避免浪费。

A fair number of refrigerators produced in the world can't guarantee even temperatures throughout the cavity: temperatures at the bottom tend to be lower than those at the top, and door balconies also tend to be slightly warmer. Placing food items in the best position can help them last longer.

全球有大量冰箱无法保持内部温度均匀一致，底部温度往往比顶部温度低，冰箱门也会微微发热。将食物摆放在最合适的位置有助于长效锁鲜。

When freezing food, it should be put in sealed containers or tightly wrapped in cling film to avoid freezer burns, and labels with content and date of freezing should always be used. How many times have we thrown away mysterious frost-covered containers simply because we couldn't remember what was in them nor when we froze it?

食物冷冻时，应将其放置在密封容器内或用保鲜膜紧紧包裹起来，以避免低温冻坏，并且还应在贴上标签，注明食物名称和冷冻日期。想想我们有多少次看着结满冰霜的神秘容器，却想不起里面装着什么，也想不起是哪天把它冻起来的，无奈之下只好扔掉。



### LOAD THE RIGHT STUFF

#### 摆放正确的食物

We would be surprised to learn that some of the stuff we are used to keep in the fridge actually doesn't really need to be refrigerated, and in some cases would do better by staying out of it. Lists of what goes in and what stays out are common, and the debate around certain items is still open, but being more careful about what foods we keep in the fridge might help reduce the sheer volume of food stored, reducing the energy consumption to keep all that crowd refrigerated. And maybe, we might find out we don't really need such a big fridge,



after all.

令人惊讶的是，有些常被我们放进冰箱的食物实际上并不需要冷藏，有些甚至常温保存效果会更好。适合放进冰箱和不适合放进冰箱的食物清单随处可见，关于某些食物应不应该放进冰箱的争论也从未停止。严谨地判断应把哪些食物放在冰箱里，有助于为冰箱“减负”。而随着冰箱内所摆放的食物数量减少，制冷所需的能耗也会相应降低。进而我们可能会发现自己其实并不需要那么大的冰箱。

### 10种不适合放进冰箱的食物

#### 1. 土豆:

我们可不想看到淀粉在低温下转化为糖。烹饪时，这种糖会与土豆中的其他化学物质结合，产生有害健康的丙烯酰胺。土豆最好保存在干燥避光的地方，切忌水洗（水分会使土豆腐烂）。

#### 2. 番茄:

低温会阻止其成熟。更重要的是，温度低于5°C时，番茄内部的薄膜会破裂。

#### 3. 热带水果:

与番茄类似，低温会阻止其成熟，并且表面会被冻伤，进而影响口感风味。

#### 4. 牛油果:

令人惊讶的是，牛油果也不适合放在冰箱里。与其他热带水果一样，低温会阻止其成熟。如果你买到的牛油果已经成熟，可放进冰箱以免它变得过于软。但在其他情况下，最好常温保存。

#### 5. 洋葱:

放在冰箱里容易发霉变质。最好把洋葱放在干燥避光的地方保存，否则可能会发芽。切忌放在土豆边上，因为土豆释放出的水分和体会使洋葱腐烂。

#### 6. 大蒜:

放在冰箱里会变色，皮下可能会发霉。

#### 7. 罗勒和新鲜香料:

低温下香味和风味会丧失，并且很快就会蔫掉。最好像鲜花一样放在桌上保存，并洒些水使之保持湿润。

#### 8. 橄榄油:

低温下会凝固变硬。

#### 9. 蜂蜜:

低温下会结晶，流动性降低。蜂蜜完全可以在室温下保存几十年。

#### 10. 咖啡:

不适合放进冰箱。低温下咖啡中的水分会流失，影响香气和风味。最好将其放在密封容器内，在室温下避光保存。

那么鸡蛋要不要放进冰箱呢？人们在这个问题上争执不休。不过一般来说，在美国、日本、澳大利亚和斯堪的纳维亚半岛，市面上出售的鸡蛋大多经过清洗，保鲜能力较差；而在欧洲，鸡蛋都是未经处理的，保鲜能力较强。因此，在美国，鸡蛋可以放进冰箱，而在欧洲，鸡蛋常温保存即可。

### PLAN A SECOND LIFE FOR YOUR LEFTOVERS

#### 剩菜“复活计”

Another way of fighting food waste is to plan for the recycling of potential leftovers. It can start with designing the original meal the ingredients are used for in such a way that any leftovers can be used in new recipes in the following days. It is also important that they are managed properly and not left indefinitely on the counter to collect heat and bacteria. “Day-after” cuisine is an increasingly popular trend and can bring many positive returns to its adepts. Italian traditional cuisine is based on the re-utilisation of leftovers from the family's rich Sunday lunch, generally consisting in a glorious pasta starter followed by roast or boiled meat: in the following days, the leftover meat would be used for meatballs, in a tomato sauce or fried; the same meat would also go into the stuffing of the some kind of tortellini or ravioli,

or to make stuffed vegetables, together with rice, while the broth would make for wonderful risotto or zuppa; leftover roast poultry would make a wonderful cold salad; leftover pasta would be pimped up with any leftover cheese or cured meats, a little béchamel and become a delicious oven-baked “pasta al forno”; in turn, leftover risotto can be sautéed the following day as a crisp version of itself.; bread can be turned into delicious bread pudding, or used as “mollica” in some pasta dishes as a cheese substitute. The variations are endless.

要杜绝食物浪费还有另一个办法，那就是提前规划好“剩菜回收方案”。从选择第一餐的原材料开始，就要考虑好在后续的几天里，可以用剩下的菜制作哪些新菜式。不过要注意合理保存，不要长时间把剩菜放在桌上，因为剩菜吸收热量后容易滋生细菌。“剩菜新做”已越来越流行，这种方式如果利用得好，可以为人们带来诸多益处。在意大利，人们会在星期天的中午和家人团聚，共同享用丰盛的午餐，许多意大利传统菜肴正是用这顿午餐的剩菜制作而成的。这顿午餐通常包含一道美味的意大利面开胃菜，主菜则是烤肉或炖肉。随后几天，吃剩的肉会被做成肉丸子，裹上番茄酱或油炸后食用；或者也可以做成意大利饺子或馄饨的馅料，甚至混上米饭做成填馅蔬菜。肉汤则被烹调成美味的烩饭或意式浓汤。剩余的烤禽肉可以拌成爽口的沙拉。吃不完的意大利面加上些吃剩的奶酪或腌肉，再撒上白酱，就化身成为香喷喷的烤意大利面。紧接着，多余的烩饭还可以在第二天做成脆口的炒饭。面包则可以用来制作香甜的面包布丁，或者用作“面包屑”，代替奶酪撒在意面上。

We must keep in mind that our refrigerator accounts for nearly 10% of our domestic electricity consumption, and that food loss and waste, if it was a country, would be the third biggest generator of greenhouse gas emissions in the world. (Source: European Food Information Council). The stakes are enormous, but we all have the power to make a difference, day after day, by making even small changes to our fridge routine. After all, saving the planet with our fridge can be entertaining, and quite satisfying.

我们必须谨记，冰箱占到了国内电力消耗的近 10%，而食物损失和食物浪费产生的碳足迹相当于全球第三大温室气体排放大国的碳排放量（来源：欧洲食品信息委员会）。对此，我们须予以重视。所幸，只要我们稍稍改变自己使用冰箱的方式，日积月累也能大有作为。而且想到自己正在通过冰箱保护地球，我们会觉得既新奇又欣慰。

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