

讲义

Recycling tyres

回收轮胎

Fuel from your wheels

用轮胎制成的燃料

Turning old tyres into new, low-emission fuel

把旧轮胎转化为新的低排放燃料

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Getting rid of old tyres has long been a problem. Every year more than a billion reach the end of the road. Until recently, most were thrown into **landfills** or **piled up** in storage yards, which occasionally caught fire. Tougher environmental laws mean many countries now insist tyres are recycled. And they are, **sort of**. Some of the methods might be better than **dumping** them, but they are not especially green.

处理旧轮胎一直是个难题。每年都有超过 10 亿个轮胎报废。直到最近，大多数报废的轮胎都被扔进垃圾填埋场或堆放在偶尔起火的仓库里。更严格的环境保护法意味着许多国家现在坚决要求回收轮胎。在某种程度上，轮胎是被回收了的。有些方法可能比丢弃报废轮胎更好，但却并不是特别环保。

【词汇】

1. **landfill** /'lændfɪl/ n. **GMAT** an area of land where large amounts of waste material are buried under the earth 垃圾填埋地（或场）

2. **dump** /dʌmp/ v. **四级** **GMAT** **考研** to get rid of something you do not want, especially in a place that is not suitable（尤指在不合适的地方）丢弃，扔掉，倾倒

例：Too much toxic waste is being dumped at sea.

太多的有毒废料在向大海里倾倒。

【词组】

1. **pile up** : to become larger in quantity or amount 堆积; 积压

例: Work always piles up at the end of the year.

年底总是积压一大堆工作。

2. **sort of** : to some extent but in a way that you cannot easily describe 有几分; 有那么一点

例: ‘Do you understand?’ ‘Sort of.’

“你懂了吗?” “有点懂了。”

Energy recovery is one common method. This involves burning tyres in an **incinerator** to generate electricity, or as a supplementary fuel to provide heat for cement **kilns** and other industrial processes. But that produces planet-warming pollution. Tyres can be used whole or **shredded** in construction projects, such as building **embankments** or repairing roads. There are, however, concerns about chemicals from the tyres **leaching** out and **contaminating** the ground.

能源回收是一种常用的方法。这包括燃烧轮胎在焚化炉中来发电，或者作为补充燃料为水泥窑和其他工业过程提供热量。但这会产生导致地球变暖的污染。轮胎可以在建设项目中整个或打碎使用，例如修建堤坝或修复道路。然而，人们担心轮胎中的化学物质会渗出并污染土地。

【词汇】

1. **incinerator** /ɪnˈsɪnəreɪtər/ n. a container that is closed on all sides for burning waste at high temperatures (垃圾) 焚化炉

2. **kiln** /kɪln/ n. a large oven for baking clay and brick, drying wood and grain, etc. 窑

3. **shred** /ʃred/ v. GRE 专八 雅思 to cut or tear something into small pieces 切碎; 撕碎

例: He instructed staff to shred sensitive documents.

他指示员工用碎纸机粉碎机密文件。

4. **embankment** /ɪmˈbæŋkmənt/ n. GRE 专八 a wall or bank of stone or earth made to keep water back or to carry a road or railway over low ground 堤; 堤岸; 堤围; (公路或铁路)路堤

5. **leach** /li:tʃ/ v. GRE GMAT to remove chemicals, minerals, etc. from soil 过滤; 滤去

例: Plastic trash drifted into rivers and oceans; so did nitrates and phosphates leaching from fertilized fields.

塑料垃圾漂入江河海洋，农田肥料渗出的氮和磷也紧随其后。

6. **contaminate** /kənˈtæmɪneɪt/ v. GMAT 考研 专八 雅思 托福 to make a substance or place dirty or no longer pure by adding a substance that is dangerous or carries disease 污染; 弄脏

例：The drinking water has become contaminated with lead.

饮用水被铅污染了。

Some firms, therefore, have begun exploring an alternative, pleasingly **symmetrical** idea. Since tyres are mostly made from **hydrocarbons**, it should be possible **in principle** to turn old tyres into low-carbon fuel which can be used to run the vehicles they came from.

因此，一些公司已经开始探索另一种两全其美的方法。由于轮胎主要是由碳氢化合物制成的，原则上应该可以将旧轮胎转化为低碳燃料，为它们所来自的车辆提供动力。

【词汇】

1. **symmetrical** /sɪ'metrɪkl/ adj. 六级 GRE GMAT having two halves, parts or sides that are the same in size and shape 对称的

例：People's bodies are never quite symmetrical.

人们的身体从来都不是完全对称的。

2. **hydrocarbon** /,haɪdrə'kɑ:rbən/ n. 六级 GMAT a chemical made up of hydrogen and carbon only. There are many different hydrocarbons found in petrol, coal and natural gas. 烃；碳氢化合物

【词组】

1. **in principle** : if something can be done in principle, there is no good reason why it should not be done although it has not yet been done and there may be some difficulties 原则上；理论上

例：In principle there is nothing that a human can do that a machine might not be able to do one day.

原则上，总会有一天，凡是人能做的事，机器就能做。

One of the most ambitious firms pursuing the idea is **Wastefront**, which is based in **Oslo**, in Norway. Later this year the company will start building a giant tyre-recycling plant in **Sunderland** in north-east England. In a couple of years, when the plant is fully operational, it will be able to turn 8m old tyres into new products, including some 25,000 tonnes of a

总部位于挪威奥斯陆的 Wastefront 公司是追求这一理念的最雄心勃勃的公司之一。今年早些时候，该公司将开始在英格兰东北部的桑德兰建立一个巨大的轮胎回收工厂。几年后，当工厂完全投入运营时，它将能够将 800 万个旧轮胎转化为新产品，其中包括大约 2.5 万吨被称为轮胎衍生油(TDO)的粘稠黑色液

goeey black liquid called tyre derived oil (TDO).

体。

【词汇】

1. **goeey** /'gu:i/ adj. soft and sticky 软而黏的；黏黏糊糊的

例：When the rice isn't cooked properly it goes lumpy and goeey.

米饭煮得不好会结块儿发粘。

【特殊名称】

1. **Wastefront** : Wastefront is a rubber waste recycling company. It converts disused tires into valuable commodities, including liquid hydrocarbons and carbon black, which can then be repurposed in alternative fuel manufacturing or ground rubber production.

Wastefront 是一家橡胶废料回收公司。它将废弃轮胎转化为有价值的商品，包括液态碳氢化合物和炭黑，然后可以在替代燃料制造或地面橡胶生产中重新利用

2. **Oslo** /'ɔ:zləu/ the capital and the most populous city in Norway 奥斯陆

3. **Sunderland** : a city and port in north-east England. In the Industrial Revolution it was an important centre for the coal and shipbuilding industries, and many people lost their jobs in the region when these industries became less active in the 1980s. It is now an assisted area. 桑德兰（英格兰东北部的港口城市）

4. **tyre derived oil** : Tyre Derived (TDO) Oil is a thick, syrupy, black, tar-like -solid in cooler temperatures. TDO, also known as bunker oil or black liquor, is a petroleum product consisting of a complicated mixture of hydrocarbons with varying boiling points. It can be classified as fuel after more valuable hydrocarbons have been removed. 轮胎衍生油
轮胎衍生油(TDO)在较低的温度下是一种粘稠的，糖浆状的黑色焦油状固体。TDO，也被称为燃料油或黑液，是一种由具有不同沸点的复杂碳氢化合物混合物组成的石油产品。在除去更有价值的碳氢化合物之后，它可以被归类为燃料。

【长难句】

In a couple of years, when the plant is fully operational, it will be able to turn 8m old tyres into new products, including some 25,000 tonnes of a goeey black liquid called tyre derived oil (TDO).

句子主干部分为 it will be able to turn 8m old tyres into new products, 意为：它将能够将 800 万个旧轮胎转化为新产品

In a couple of years 为时间状语，意为：几年后

when the plant is fully operational 为时间状语，意为：当工厂完全投入运营时

including some 25,000 tonnes of a gooey black liquid called tyre derived oil (TDO) 为非限制性定语从句，附加说明

new products, 意为：（新产品中）包括大约 2.5 万吨被称为轮胎衍生油(TDO)的粘稠黑色液体

其中，called tyre derived oil (TDO)是后置定语，修饰限定 gooey black liquid, 意为：被称为轮胎衍生油(TDO)的（粘稠黑色液体）

The process works by deconstructing a tyre into its three main components. One is steel, which is used to brace the structure of a tyre and which can be readily recycled. The second is carbon black, a powdery, soot-like form of carbon used to improve the durability of the tyre. The third is rubber. Some of that will be natural rubber obtained from the sap of rubber trees. Some will be the synthetic sort, which is made in factories from crude oil.

这个过程的工作原理是将轮胎分解成三个主要部分。一种是用来加固轮胎结构的钢材，它可以很容易地被回收利用。第二种是炭黑，这是一种粉末状、类似烟灰的碳，用于提高轮胎的耐久性。第三种是橡胶。其中一些是从橡胶树的汁液中提取的天然橡胶。有些将是合成橡胶，由工厂用原油制成。

【词汇】

1. **brace** /breɪs/ v. 六级 GRE GMAT 考研 雅思 to make something stronger or more solid by supporting it with something 加强；加固

例：The roof was braced by lengths of timber.

屋顶用几根木头支撑固定住了。

2. **soot-like** adj. resembling soot 似煤烟的,似煤灸的

soot /sʊt/ n. black powder that is produced when wood, coal, etc. is burnt 煤烟子；油烟

3. **durability** /ˌdʊrəˈbɪləti/ n. GMAT the quality of being able to last for a long time without breaking or getting weaker 耐用性；持久性

4. **sap** /sæp/ n. GRE GMAT 专八 the liquid in a plant or tree that carries food to all its parts (植物体内运送养分的) 液，汁

5. **synthetic** /sɪnˈθetɪk/ adj. 四级 GRE 考研 artificial; made by combining chemical substances rather than being produced naturally by plants or animals 人造的；（人工）合成的

例：Boots made from synthetic materials can usually be washed in a machine.

用合成材料做成的靴子通常可以在机器里洗。

6. **crude** /kru:d/ adj. 四级 GRE GMAT 考研 in its natural state, before it has been processed or refined 天然的；自然的

例：On the eve of the Revolution, the colonies produced thirty thousand tons of crude iron a year.

独立战争前夕，北美十三州每年生产 3 万吨生铁。

【特殊名称】

1. **carbon black** : the pure black powder obtained by burning hydrocarbons under the condition of insufficient air, and then separated from exhaust gas. 炭黑

炭黑，为在空气不足的情况下燃烧碳氢化合物得到极细微碳黑粉，再与废气分离后所得之纯黑粉末。

In order to do the deconstructing, the tyres are first shredded and the steel bracing removed. The remaining material then goes through a process called **pyrolysis**. This involves exposing a material to high temperatures in the absence of air. That causes the rubber to **decompose** into a mix of hydrocarbon gases, which are **drawn off**. What is left behind is pure carbon black.

为了进行拆解，首先将轮胎切碎并去除钢支架。剩下的物质会经过一个叫做裂解的过程。这包括在没有氧气的情况下将材料暴露在高温下。这导致橡胶分解成碳氢化合物气体的混合物，这些气体被排出。剩下的是纯炭黑。

【词汇】

1. **pyrolysis** /paɪˈrɒlɪsɪs/ n. a thermochemical decomposition of organic material at elevated temperatures in the absence of oxygen (or any halogen) 裂解；热解；高温裂解

2. **decompose** /ˌdi:kəmˈpəʊz/ v. 六级 GRE 雅思 to break down something into smaller and simpler parts; to break a substance down into smaller and simpler parts (使) 分解

例：Water decomposes into oxygen and hydrogen.

水分解成氧气和氢气。

【词组】

1. **draw off** : to remove some liquid from a container or the body 抽出；排掉

例：While the rest of the gas is vented, the CO₂-rich solvent is drawn off.

当剩余的气体被排出时，富含二氧化碳的溶剂被排出。

Once the drawn-off gas has cooled down, a proportion of it liquefies into TDO. The remaining gases, which include **methane**, are **funnelled** back around to be burned, fuelling the reactor. This, says Vianney Valès, Wastefront's boss, creates a **closed-loop** system that prevents emissions. The overall output of the process by weight is 40% TDO, 30% carbon black, 20% steel and 10% gas.

排出的气体冷却下来后，一部分气体就会液化成 TDO。剩余的气体，包括甲烷，被输送回炉中燃烧，为反应堆提供燃料。Wastefront 的老板 Vianney Valès 表示，这创造了一个减少排放量的闭环系统。按重量计，在该工艺的产物中，TDO 占 40%，炭黑占 30%，钢占 20%，气体占 10%。

【词汇】

1. **methane** /'meθeɪn/ n. GMAT 专八 (symbol CH₄) a gas without colour or smell, that burns easily and is used as fuel. Natural gas consists mainly of methane 甲烷；沼气
2. **funnel** /'fʌnl/ v. GMAT 专八 雅思 to move or make something move through a narrow space, or as if through a funnel (使) 流经狭窄空间，经过漏斗形口子
例：Huge pipes funnel the water down the mountainside.
巨大的管道把水沿山坡输送下山。
3. **closed-loop** /'kləʊzdlu:p/ n. an automatic control system in which an operation, process, or mechanism is regulated by feedback. 闭环；闭合回路

The carbon black can be re-used to make new tyres. That is of interest to tyre-makers because it helps efforts to become carbon neutral. Producing new carbon black requires the partial burning of heavy oil **residues** or coal, which produces plenty of greenhouse-gas emissions.

炭黑可以再次用于制造新轮胎。轮胎制造商对此很感兴趣，因为这有助于实现碳中和。生产新的炭黑需要部分燃烧重油残渣或煤，这会产生大量的温室气体排放。

【词汇】

1. **residue** /'rezɪdu:/ n. GRE GMAT 托福 a small amount of something that remains at the end of a process 剩余物；残留物；残渣

The recovered TDO is similar to crude oil fresh from the ground, and is well-suited for making **diesel**. To do that, Wastefront is working with Vitol, a Swiss company that is the world's largest independent oil trader, and which operates a number of **refineries** around the world.

回收的 TDO 和刚从地下开采出来的原油类似，非常适合制造柴油。为此，Wastefront 正与维托尔(Vitol)合作，维托尔是一家瑞士公司，是世界上最大的独立石油贸易商，在世界各地经营着多家炼油厂。

【词汇】

1. **diesel** /'di:zl/ n. 六级 GMAT a type of heavy oil used as a fuel instead of petrol 柴油
2. **refinery** /rɪ'faɪnəri/ n. 六级 a factory where a substance such as oil is refined (石油等的) 精炼厂，提炼厂，精制厂

While not completely carbon-neutral, diesel made from TDO does produce an 80-90% reduction in emissions of carbon dioxide, the main greenhouse gas, compared with the conventional fuel. The future market for cleaner fuels is likely to remain substantial, even though electric vehicles are steadily replacing those with **combustion engines**. Fossil-fuelled vehicles will remain on the road for decades to come, particularly large commercial vehicles like lorries, which are harder to electrify and which are big burners of diesel. The fuel will also be needed by trains and ships. So, anything that helps to clean up overall emissions during what will be a long transition to the electrification of transport is useful—especially if it also shrinks a **mountainous** waste problem.

虽然用 TDO 制成柴油并没有达到完全碳中和，但与传统燃料相比，由 TDO 制成的柴油确实能减少 80-90% 的主要温室气体——二氧化碳的排放。尽管电动汽车正在稳步取代内燃机汽车，但未来清洁燃料的市场可能仍然很大。在未来几十年里，化石燃料汽车仍将继续上路，尤其是像卡车这样的大型商用车，它们更难电气化，而且大量燃烧柴油。火车和轮船也需要这种燃料。因此，在向交通电气化过渡的漫长过程中，任何有助于减少总体排放的措施都是有益的——尤其是如果这种措施还能减少堆积如山的废弃物问题。

【词汇】

1. **mountainous** /'maʊntənəs/ adj. 六级 高考 very large in size or amount; like a mountain 巨大的；山一般的
例：The plan is designed to reduce some of the company's mountainous debt.
该计划旨在减少公司堆积如山的债务。

【特殊名称】

1. **combustion engine** : an engine which generates mechanical power by combustion of a fuel 内燃机

【长难句】

So, anything that helps to clean up overall emissions during what will be a long transition to the electrification of transport is useful—especially if it also shrinks a mountainous waste problem.

句子主干部分为 anything that helps to clean up overall emissions is useful, 意为：任何有助于减少总体排放的措施都是有益的

其中, that helps to clean up overall emissions 是定语从句, 修饰限定 anything, 意为：有助于减少总体排放的（任何措施）

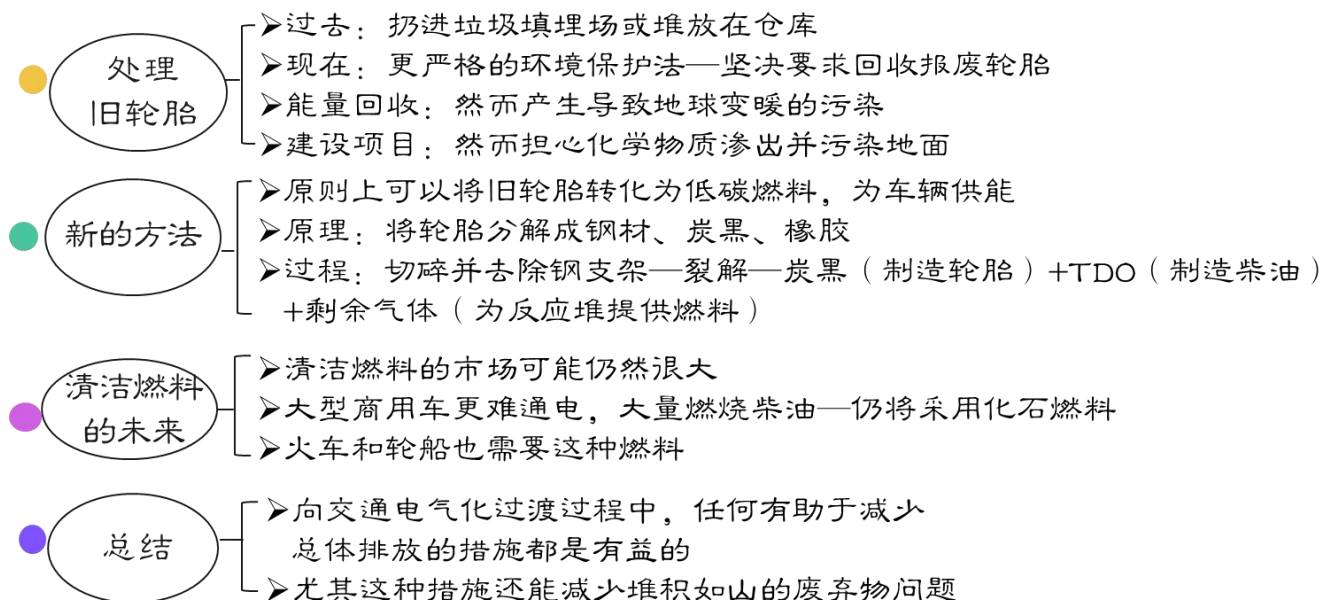
So 是状语, 意为：因此

during what will be a long transition to the electrification of transport 是时间状语, 意为：在向交通电气化过渡的漫长过程中

especially if it also shrinks a mountainous waste problem 是条件状语, 意为：尤其是如果这种措施还能减少堆积如山的废弃物问题。

总结

1) 文章架构



2) 同义替换

✓ 回收

recycle

One is steel, which is used to brace the structure of a tyre and which can be readily recycled

一种是用来加固轮胎结构的钢材，它可以很容易地回收利用。

recover

The recovered TDO is similar to crude oil fresh from the ground

回收的TDO和刚从地下开采出来的原油类似

其他：reclaim/retrieve/recall

例：Oscar Mayer is recalling 96 thousand pounds of wieners because they contain cheese.

Oscar Mayer 回收 9.6 万磅法兰克福香肠，原因是这些香肠含有奶酪。

✓ 分解

deconstruct

The process works by deconstructing a tyre into its three main components.

这个过程的工作原理是将轮胎分解成三个主要部分。

decompose

That causes the rubber to decompose into a mix of hydrocarbon gases

这导致橡胶分解成碳氢化合物气体的混合物

其他： resolve/disintegrate/break into

例：The cardboard disintegrates organically.

硬纸板是会自然分解的。

3) 一词多义✓ **brace**

- ✓ 文章原句：One is steel, which is used to brace the structure of a tyre 一种是用
来加固轮胎结构的钢材

✓ 释义：

① **to make something stronger or more solid by supporting it with something** 加强；加固

The roof was braced by lengths of timber.

屋顶用几根木头支撑固定住了。

② **to prepare somebody/yourself for something difficult or unpleasant that is going to happen** (为困难或坏事) 使做准备；使防备

They are bracing themselves for a long legal battle.

他们在为漫长的法律诉讼做准备。

③ **to press your body or part of your body strongly against something in order to stop yourself from falling** 使(身体或身体部位)顶住, 抵住(以免跌倒等)

They braced themselves against the wind.

他们顶着大风吹稳。

④ **to contract the muscles in your body or part of your body before doing something that is physically difficult** (做费劲的事之前) 绷紧肌肉

He stood with his legs and shoulders braced, ready to lift the weights.

他绷紧腿和肩膀站着，准备举起杠铃。

✓ **crude**

✓ 文章原句：Some will be the synthetic sort, which is made in factories from crude oil. 有些将是合成橡胶，由工厂用原油制成。

✓ 释义：

① **in its natural state, before it has been processed or refined** 天然的；自然的

On the eve of the Revolution, the colonies produced thirty thousand tons of crude iron a year.
独立战争前夕，北美十三州每年生产 3 万吨生铁。

② **offensive or rude, especially about sex** 冒犯的，粗俗的，粗鲁的

He was critical of the people, disparaging of their crude manners

他对那些人很有看法，看不起他们粗俗的举止。

③ **simple and not very accurate but giving a general idea of something** 粗略的；简略的；大概的

In crude terms, the causes of mental illness seem to be of three main kinds.

简略地说，导致精神病的原因看起来主要有三种。

④ **simply made, not showing much skill or attention to detail** 粗糙的；粗制的

Primitive man hunted wild animals with crude stone implements.

原始社会的人用粗糙的石器猎取野兽。

4) 仿写训练

✓ 描述方法的局限性

✓ 文章原句：

Energy recovery is one common method. This involves burning tyres in an incinerator to generate electricity, or as a supplementary fuel to provide heat for cement kilns and other industrial processes. But that produces planet-warming pollution. Tyres can be used whole or shredded in construction projects, such as building embankments or repairing roads. There are, however, concerns about chemicals from the tyres leaching out and contaminating the ground.

✓ 句型：

... is one common method. ... 是一种常用的方法

But ... 但是...

... can可以...

There are, however, concerns about ... 然而，人们担心...

✓ 仿写示例：

Sweating with a quilt is one common method to bring down the fever. But this may result in only perspiration and not heat dissipation, which can lead to super high body temperature. Rubbing the body with alcohol can reduce fever. There are, however, concerns about alcohol seeping into the person's body and causing alcohol poisoning.

✓ 仿写作业——描述理财方法的局限性

储蓄是一种常用的理财方法。

但是这种方式收益率太低。

股票可以进行投资理财。

然而，人们担心股票的极大风险，这可能导致收益非常不稳定。

5) 主题词总结

今日主题——汽车与燃料	
1. low-emission fuel	低排放燃料
2. carbon black	炭黑
3. diesel	柴油
4. refinery	炼油厂
5. conventional fuel	传统燃料
6. electric vehicle	电动汽车
7. combustion engine	内燃机汽车
8. cleaner fuel	清洁燃料