加入WTO电力行业英语学习丛书

电力专业
英语培训教材

郑仰成　聂建中　主编

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内容提要

全书共有15个单元，30篇文章。这些经过精心选编的文章其内容基本涵盖了电力专业的方方面面。书中每个单元分课文A和课文B。课文A可作为精读课内容，课文B可作为自学或阅读之用。在课文A之后，还包括每课的生词表、基本语法常识、课文练习。本书还配有练习答案以及参考译文。

本书可作为行业培训、成人教育、大中专电力相关专业教材，也适宜电力工程技术人员及外事工作者阅读。

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加入 WTO 电力行业英语学习丛书

编 委 会

前　言

我国加入WTO后，电力行业对外交流、引进技术和设备以及涉外活动的日趋频繁，广大电力行业的工程技术人员迫切需要有一本较好的电力专业培训教材，来提高他们的英语交际能力和英语阅读能力。这本新编的《电力专业英语培训教材》正好满足了广大电力工程技术人员的这种迫切需要。本书的编写，既注意了语言本身的规律和语言教学的规律，又照顾到了电力工程技术人员专业工作的特点。

全书共有15个单元，30篇文章，其内容基本涵盖了电力生产的方方面面，并适当选择了一部分有关电力生产新概念，新技术的英语科技文章。书中每个单元分课文A和课文B。课文A可作为精读课内容，课文B可作为自学或阅读之用。在课文A之后，还包括每课的生词表、基本语法常识、课文练习，这样的编排更有利于培训工作的开展或专业英语的教学活动。

本书由郑仰成、聂建中主编，崔建农和曹晓强同志任副主编，第一至第五单元由杨丽编写，第六至第七单元由赵建会编写，第八至第十单元由杜军编写，第十一至第十五单元由康霞编写。

由于我们水平有限，书中一定有不少错误和缺点，恳请广大读者赐教。

作　者

2002年10月

目　　录

Unit 1

Text A

Recycling the Waste

Concern over global warming and the effect of pollution caused by the burning of brown fuels has become a major issue for governments. Recent encouragement from the European Union Directives to the Member States for the recovery of waste by means of recycling and the use of waste as a source of energy has produced waste-to-energy (WTE) plants across Europe[1].

The Lomellina Energia Recycling plant in Parona, near Milan, is an integrated WTE facility for the recovery of recyclable materials, the production of refuse derived fuel (RDF), composting and electricity generation. Foster Wheeler Italiana (FWI), owns 98 per cent of the plant and was responsible for the development, construction, ownership and operation of the facility.

The plant, which began operation in July 2000, required an investment of £130 million ($121 million) and was financed by 24 per cent of equity and 76 per cent of debt. The plant is capable of handling RDF with a LHV[2] range of 2500-4000 kcal/kg.

Modern WTE plants are very different from the old incinerators thanks to technological progress made over the last few decades. They have two priorities: respect for the environment and the efficient generation of electricity. An important improvement has been achieved by converting municipal solid waste (MSW) into a real fuel that can be easily stored, transported and efficiently burned. From the combustible fraction of MSW it is

easy to obtain a product that is much more homogeneous and stable than MSW. This material is known as RDF and is a mix of particles of paper, paperboard, rubber, plastic, textile, leather and wood. Around 60 per cent of the MSW is converted into RDF and the balance yields reusable aluminum, ferrous materials, glass and compost.

RDF is an ideal fuel as it has a good heating value, a controlled chemical composition, no smell and can be used by one of the most efficient combustion technologies is available today-circulating fluidized bed (CFB) boilers. A CBF boiler is at the heart of the Lomellina plant and was selected as the technology to generate electricity because of its inherently strong environmental performance.

The Lomellina Energia recycling plant is designed to recover material and energy from 200000 t/year of MSW. The sorting process is attractive from the point of view both of recycling and for the production of RDF, a fuel that can be easily burned and produces very low quantities of bottom ash; The net power output of the facility, which commenced operation earlier this year, is about 17 MW[3]. Electricity produced at Lomellina is sold to Enel under a 15-year Power Purchase Agreement (PPA). For the first eight years of operation the electricity tariff includes an incentive since energy from waste is considered a renewable source of energy.

In addition to electricity sales, the MSW is also a source of revenue for the plant owners. A framework agreement has been signed with the Province of Pavia, which has appointed Lomellina as the "designated plant" for a total of 96 municipalities in the Province. This framework agreement ensures that the municipalities have to deliver all their waste to the Lomellina plant at an

inflation adjustable gate-fee of £28/t of MSW. Separate waste delivery agreements have been signed with municipalities in order to detail the specific terms and conditions for waste delivery.

The contracts have a put-or-pay character, which means that even if the municipalities deliver less than the agreed committed quantity, they will have to pay an amount based on the agreed gate fee and committed quantity. The system was started in December 1999, six months prior to the scheduled power plant start up. This was necessary in order to guarantee the disposal of MSW in a district which is suffering from a serious emergency due to the closure of landfill facilities.

At Lomellina the MSW waste is separated. After the first shredding MSW is sent for separation into three streams: an organic rich fraction (60mm); a metals rich fraction (60-120 mm) and a combustible rich fraction (120mm). The combustible rich fraction, after the removal of ferrous material through magnetic separators, is conveyed to magnetic separators for recovery of ferrous metals and to eddy current separators for recovery of aluminium cans. The remaining material is mixed with the combustible rich fraction and the waste material is shredded to a particle size of 90 mm or less.

The RDF then passes through the last magnetic separator and is conveyed to a storage building which can store enough material for three days of boiler operation at full capacity. By compressing the RDF this capacity can be increased to six days.

The organic rich fraction is stabilized using an anaerobic fermentation process. During this process, air for composting is partially taken from the MSW receiving and sorting building. This causes a slight negative pressure that results in a steady flow of fresh outside air through these areas. A biofilter treats

the air from composting and from the MSW processing buildings. The stabilized product is sent to the secondary trammel where materials over 20 mm in size are recovered and conveyed to the RDF stream.

The remaining organic fraction can be refined using an air classifier for the separation of glass and other solid inert. The low quality compost derived from stabilization of the MSW organic fraction can be directed to compost storage or to the RDF stream.

The RDF is delivered to three parallel fuel feed systems sized for 50 per cent capacity at full load. From here the RDF is transported to the furnace where air is injected to transport the heavier bed particles towards the drain connected to the stripper-coolers and allows for fluidification of the remaining lighter particles. Secondary air is then injected in the furnace at two elevations above the bed to achieve a staged uniform combustion. Inside the furnace RDF is burnt in this hot, fluid suspension bed, entrained in a substantial upward flow of gas. Coarse solids are separated from the gas stream, which exits the top of a cyclone and is completely cooled with saturated steam from a drum.

This design effectively handles the thermal variations and gives reliable operation and shortens the start-up time. The cyclone separates the entrained solids including unburned carbon from the flue gas and returns them to the furnace providing an excellent carbon burn-out. From the cyclone the flue gas flows through the idle pass for lowering the temperature before entering the convection section of the boiler at 650°C and then through the vestibule over the primary and intermediate super-heater sections. From the vestibule, flue gas flows down through the heat recovery area over the evaporator and the economizer and finally

flows out through the lower gas exit.

Notes

1. from…to… 介词短语及 for 引导的介词短语都作主语 recent encourage 的定语，而 by means of…energy 部分则是 reco-very的定语，后面才是谓语及宾语部分。

2. LHV：low heat value 低热值。

Words and Expressions

recycle [ri'saikl] *v.* （使）再循环；回收利用；再制

recover [ri'kʌvə] *v.* 重新获得，重新找到；恢复，使恢复健康；使身体复原

recovery [ri'kʌvəri] *n.* 重获，复得；复原，痊愈

integrate ['intigreit] *v.* 使结合，使并入，使一体化；结合起来，成一体

integration [ˌinti'greiʃən] *n.* 结合，综合；一体化

facility [fə'siliti] *n.* 设备，工具；方便，便利

compost ['kɔmpɔst] *v.* 把……做成堆肥，施堆肥于…… *n.* 堆肥，混合肥料

equity ['ekwiti] *n.* 公平，公道；公平的事物

incinerator [in'sinəreitə] *n.* 焚化炉，焚烧炉

priority [prai'ɔrəti] *n.* 优先权；先，前

convert [kən'və:t] *v.* 转变，变换；改变信仰

combustible [kəm'bʌstəbl] *a.* 可燃的

combustion [kəm'bʌstʃən] *n.* 燃烧

homogeneous [ˌhɔmə'dʒi:niəs] *a.* 同类的，同族的，相似的

yield [ji:ld] *v.* 出产，生长出（作物等），结出（果实）；屈服，投降. *n.* 产量，收获量，收益

ferrous [ferəs] *a.* 铁的，含铁的

composition [kəm'pəziʃən] *n.* 成分，组成，构成；合成物，混合物

fluid ['flu:id] *n.* 流体，液 *a.* 流动的，流体的，液体的

inherent [in'hiərənt] *a.* 内在的，本质的，固有的

inherently [in'hiərəntli] *ad.* 生来地

sort [sɔ:t] *n.* 种类，类别 *v.* 把……分类，整理；拣选

tariff ['tærif] *n.* 关税表，关税率，关税

commence [kə'mens] *v.* 开始，正式倡导

municipality [mjuˌnisi'pæliti] *n.* 市，自治城市，自治地区

ensure [in'ʃuə] *v.* 保证，担保；使安

全

detail [ˈdi:teil] *v*. 详述，细说 *n*. 细目，细节

schedule [ˈʃedju:l] *n*. 议程表，程序表，议事日程；一览表，细目单 *v*. 安排，排定

guarantee [gærənˈti:] *v*. 保证，担保

shred [ʃred] *v*. 撕碎，切碎 *n*. 碎片，碎条

convey [kənˈvei] *v*. 搬运，转运，运送(旅客，货物等)；(声音等)，传送

anaerobic [əˌniəˈrɔbik] *n*. 厌氧微生物，厌气微生物

fermentation [fə:menˈteiʃən] *n*. 发酵

trammel [ˈtrɔməl] *n*. 滚筒筛，洗矿筒

inert [iˈnə:t] *a*. 无自动力的，无活力的；惰性的，不活泼的

entrain [inˈtrein] *v*. 拖，拽，带走(人或物)；(化) 带走

saturate [ˈsætʃəreit] *v*. 使饱和，使中和；浸透，使充满 *a*. 浸透的，饱和的

convection [kənˈvekʃən] *n*. (热、电等的) 对流，运流

vestibule [ˈvestibju:l] *n*. 门厅，前厅，气门室

economizer [iˈkɔnəmaizə] *n*. 省煤器，废气预热器

suffer [ˈsʌfə] *v*. 遭受，蒙受；经历，受痛苦；受损失

in detail 详细地

by means of 用，依靠，通过

in addition to 除……之外

prior to 先于

Grammar 名词 (Noun)

名词是用来表示人、物、概念的名称，如 chemist (化学家)，bus (公共汽车)，science (科学)。

1. 名词的种类

英语的名词分专有名词和普通名词。

(1) 专有名词。用来表示人物、地点和机构等的专有名称。如：Marx 马克思，China 中国，Beijing 北京等。

(2) 普通名词。用来表示人或物的通称。这类名词又可分为可数名词和不可数名词两种。可数名词是指可以计数的名词，如：college (学院)，engineer (工程师) 等。不可数名词是指不可计数的名词，如：electricity (电)，fuel (燃料) 等。

2. 名词的数

可数名词通常有单数和复数两种形式。表示数量为一个时，名词用单数形式；表示数量多于一个时，名词用复数形式。通常是在单数名词末尾加上 -s 或-es，便构成它的复数形式。

(1) 绝大多数名词直接加-s 即可构成复数形式，如：

tube（管子）— tubes　motor（电动机）—motors

radio(收音机)—radios　generator(发电机)— generators

(2) 以字母-s，sh，-ch，-x 结尾的词加-es，如：

watch（表）— watches　box（箱子）— boxes

bus（公共汽车）— buses　brush（刷子）— brushes

关于名词复数形式的构成，还有一些特殊情况须注意掌握。

3. 名词的所属关系

名词表示所属关系即“谁的”时，可采用两种方式。

(1) 在名词末尾加“'s”；如果名词以-s 结尾，则只需在 s 的右上角加“'”，如：

the car's engine 汽车引擎

(2) 在名词后面，用“of＋名词”表示，如：

the design of the new turbine 新涡轮机的设计

4. 名词在句子中的用法

名词在句子中可作主语、表语、宾语、定语、同位语，以及宾补，介宾，如：

The **panel** tells you the conditions of a machine's operation.（主语）

控制盘告诉你机器运作的情况。

Their factory produces **generators**.（宾语）

他们工厂生产发电机。

There happened an accident in **boiler** room yesterday.（定语）

昨天，锅炉房发生了一起事故。

其他用法不再一一列举。

Exercises

I. *Reading Comprehension* (*Say whether the statements below are True or False according to the text*)

1. _____ The Member State of the European Union Directives themselves have produce waste-to energy (WTE) across Europe.

2. _____ Foster Wheeler Italian (FWI) own the plant completely.

3. _____ MSW can be easily stored, transported and efficiently burned.

4. _____ RDF is much more homogeneous and stable than MSW.

5. _____ The plant is designed to recover material and energy from 200000 t/year of RDF.

6. _____ Lomellina is designated as electricity supplier for 96 municipalities in Pavia.

7. _____ The municipalities have signed waste delivery agreements with Lomellina plant respectively.

8. _____ It doesn't matter even if the municipalities deliver less than the agreed committed quantity.

9. _____ The stabilized product over 20mm in size and the low quality compost derived stablization of the MSW organic fraction can be delivered to the RDF stream finally.

10. _____ Air is injected in the furnace to realize the fluidification of the heavier particles.

Ⅰ. *Choose the definition from column B to match the word in column A.*

A	B
1. recycle	a. thing that is regarded as more important than others
2. integrate	b. that can be adjusted
3. priority	c. action or process of fermenting
4. ferrous	d. the transmission of heat from one part of a liquid or gas to another
5. adjustable	e. treat used material so that it can be used again
6. fermentation	f. produce or provide (a natural product, a result or profit)
7. inherent	g. combine something in such a way that it becomes fully a part of something else
8. convection	h. containing or relating to iron
9. yield	i. remainder of something after part has already been used, taken, etc.
10. balance	j. existing as a natural or permanent feature or quality of somebody or something

Ⅱ. *Fill in the blanks with the proper form of the given words.*