

A photograph of an offshore wind farm at sunset. The sun is low on the horizon, casting a warm orange glow over the sky and water. Several wind turbines are visible, their silhouettes reflected in the calm water. The overall scene is peaceful and scenic.

離岸風電 Off Shore Wind Power

文、圖 / Kenny

別讓我們的肺部成為空氣濾淨機。年復一年，在罹患肺癌的人數一直不斷地增加下，大家對於空氣品質的意識逐漸抬頭。近幾年來，我們的政府把注意力都放在綠能發電的發展上，最受關注的就是太陽能光電，這是和火力發電比較之下，汙染程度是相對非常低的。這就是綠能發電有一天會成為主流的原因。然而，太陽能發電對於日照時數是非常倚賴的，但是冬季的日照時數和夏季的日照時數不可同日而語，特別是北臺灣。我們用不著擔心，風力發電可以挽救整體的情勢，因為在冬天的時候，風勢較夏季強上許多，特別是離岸地區。讓我們來看看，政府如何把風電帶入你我的生活中。

Don't let our lungs become a filter. Year by year, the issue of air quality gradually gains the attention of the public owing to the increasing number of lung cancer patients. In recent years, our government puts their attention on green energy development, and the most known one is solar energy, which is much less polluting than thermal energy when it comes to generating power. That's the reason why green energy will take the position. However, solar energy heavily relies on sunshine duration, but the sunshine duration in winter is not as long as that in summer, especially in the north of Taiwan. No need to worry, wind power can save the situation because the wind is much stronger in winter and especially in offshore areas. Let's see how the government brings wind energy to our lives.

One day, Johnny is very excited to show his father the A++ he got on the English exam, and asks his father, Joseph, to take him out to the farm on this following weekend. Joseph is quite happy to know his son performed well on the academics, and says "of course~" in response to his son's request.

(有一天，強尼，非常興奮地拿出 A++ 的英文成績給他的爸爸看，並要求爸爸，喬瑟夫，在即將到來的週末，可以帶他去農場 (farm) 玩。喬瑟夫對於兒子在學業上的表現感到非常開心，並對於兒子的要求，便一口答應了，"of course~"。)

J : Daddy, look! I got A++ on the English exam. Can you take me out to the farm on this following weekend as a reward?

(爹地，你看！這次的英語考試，我拿到 A++ 喔。可以在這個週末帶我去農場 (farm) 玩作為獎賞嗎？)

D : Well-done! Of course! Let's go to the farm this weekend.

(做的好！當然阿！這週末我們就去農場 (farm) 看看吧。)



Jonny and Joseph seem on the same page. They both say going to the farm. In fact, the truth is not like that. Johnny is thinking about the animal farm, but Joseph means the wind farm. Let's see what will happen!

(強尼和喬瑟夫看起來是在講同一件事。他們倆同時提到要去 "farm" 玩。但是事實卻非如此。強尼是在想著去動物農場玩 (animal farm)。但是喬瑟夫卻是意指風力發電場 (wind farm)。讓我們一起來看看究竟會發生什麼事吧！)

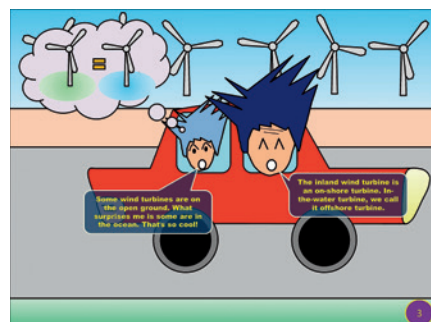
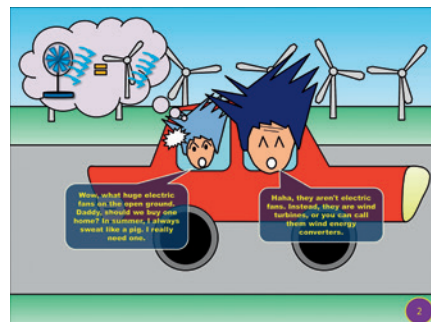
J : Wow, what huge electric fans on the open ground. Daddy, should we buy one home? In summer, I always sweat like a pig. I really need one.

(挖，好大的電風扇在這廣闊的大地上。爸爸，我們是不是要買一台回家呢？在夏天，我總是汗流浹背。我真的需要一台。)

D : Haha, they aren't electric fans. Instead, they are wind turbines, or you can call them wind energy converters.

(哈哈，它們不是電風扇啦。然而，他們是風力發電機，或者你可以稱他們為風能電力轉換器。)

J : Some wind turbines are on the open ground. What surprises me is some are in the ocean. That's so cool!



(有一些風力發電機是在開放的大地上。讓我最驚訝的是，有一些風力發電機居然是在海上。多麼酷的一件事情啊！)

D : The inland wind turbine is an on-shore turbine. In-the-water turbine, we call it off-shore turbine.

(內陸的風力發電機稱為陸地風力發電機。插在水裡的風力發電機，我們稱之為離岸風電。)

J : So gigantic! When the wind blows, the wind turbine blades start to rotate. Why is the size so different between an on-shore and off-shore wind turbine? Which one can generate more power?

(好巨大喔！當風一吹，風力發電機的扇葉就開始轉動。為什麼岸上和離岸的風力發電機尺寸有差異呢？哪一種風力發電可以產生更多的電力呢？)

D : Giant turbine blades can capture wind, and wind turbine will convert the wind power into electricity, because stronger wind makes off-shore wind turbine generate more energy. The inland turbine suffers from poor and not constant wind due to the physical blockages, for example, hills or buildings.

(巨大的扇葉是用來抓住風的，它會將風能轉換為電力。離岸風電機有一個比起沿岸風電機最大的優點是可以產生更多的電力。內陸的風電機會受到山丘或是建築物阻擋的影響，會導致風力微弱以及無法提供穩定的風力的狀況。)

J : What a big system out at sea! What is the function of the small-in-the-ocean house?

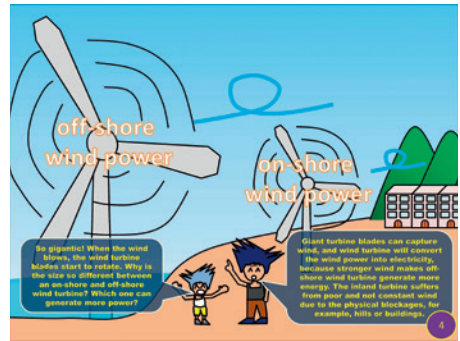
(這是在海上的一個龐大的系統！。那間在海裡的小間房子是有什麼功能呢？)

D : We call it off-shore wind farm! The electricity generated from all the turbines is fed to a single off-shore substation which is "small-in-the-ocean house" you mentioned, and it will transport the electricity to shore via high voltage cables.

(我們稱其為離岸風電場！所有的風力發電機在產生電力後，將電力匯集到離岸變電站，就是剛剛提及的”海裡的小間房子”，便將藉由高電壓電纜線將電力傳送到岸上。)

J : There are wind turbines here. They are all located in the shallow sea areas. I think it is rather easy for engineers to fix the wind turbines on the seabed, right?

(這裡有很多風力發電機耶。它們都設置在淺海區。我認為這是因為工程師比較容易將風力發電的機組固定在海床上，對嗎？)



D : You got the point! As mentioned, the electricity from all turbines will be collected at the off-shore substation, and be transported to the on-shore substation, then, to city power grids. Finally, the electricity will be distributed to everybody's home.

(你說到重點了!像我們談及的,電力透過風力發電機組產生後,便會被匯集到離岸變電站上,然後被傳送到岸上的變電站,之後再被傳送到城市中的電線網絡。最後,將會把電力送到每一個人的家中。)

J : From the graphic, the summertime has longer sunshine hours but wind intensity is much weaker. Therefore, it's not the best season for wind power. Solar energy plays a big role in the summertime!

(從圖表看起來,夏季時的日照時數較強,但是風力弱很多。因此,不是個適合發展風力發電的季節。太陽能在夏季時就扮演著重要的角色。)

D : Sure! Look at the winter! We take advantage of this strong-wind season to develop wind power. The off-shore wind power plants take more responsibility to make up the lost power from solar energy in winter.

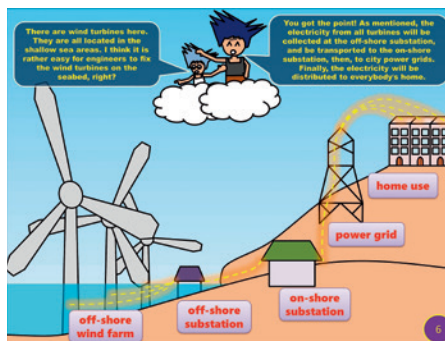
(當然,看看冬季的部分!我們利用強風季節來發展風力發電。離岸風電就必須承擔更多的責任,去彌補太陽能因為冬季日照時數較短而無法產生的電量。)

J : Daddy, you are a liar. You promised me to take me to the farm to see farm animals like horses, cows, chickens and so on. You break the promise.

(爸爸,你這個騙子。你答應我要帶我去農場看動物的,例如,馬、牛以及雞,等等。你說話不算話。)

D : Nope! I say I will take you to the "farm" but it's not an "animal farm." Instead, it's an "off-shore wind farm." Haha, I still keep my word. Next time, if you get another A++, and then I promise you I will take you to the animal farm.

(不!我說我會帶你去 "farm",但是不是 "動物的 farm"。然而,是指 "離岸風電 (off-shore wind "farm")"。哈哈,所以我還是信守承諾的。下次,如果你得到另一個 A++,我就會答應你,帶你去動物農場看動物。)



Word Bank

1. filter (n.) (過濾器、除去物件的裝置)

→ The air filter has become one of the life necessities in response to the bad air quality.
(空氣清淨機已經成為生活中的必需品之一，為了因應不佳的空氣品質。)

2. gain the attention (phrase) (獲取注意)

→ As a singer, she is trying to gain attention from people by singing good songs.
(身為一位歌手，她正嘗試著透過唱出好聽的歌曲，來獲取大家的注意。)

3. green energy (n.) (綠能)

→ Green energy is also called renewable energy, by which we can generate energy in an environmental-friendly way.
(綠能，也被稱作再生能源，我們可以用一種對環境友善的方式，來生產電力。)

4. solar energy (n.) (太陽能)

→ In the south of Taiwan, many households are using the water heater, which is driven by solar energy.
(在台灣南部，很多住家使用熱水器，是由太陽能來驅動的。)

5. thermal energy (n.) (火力發電)

→ In Taiwan, people try to reduce the proportion of thermal energy use because we do not want the side effect of severe air pollution.
(在台灣，人們嘗試著漸少火力發電使用的比例，因為我們不想要它帶來的副作用，嚴重空氣污染。)

6. request (v.) (請求、要求)

→ Visitors are requested not to walk on the grass.
(遊客被要求不要在草皮上行走。)

7. reward (n.) (獎賞、報答、酬謝)

→ Whoever finishes the project first will get the prize for 3,000 NT dollars as a reward.
(不論是誰先完成了專案，將會得到臺幣 3,000 元，作為獎金。)

8. well-done (phrase) (做得好)

→ Well-done! You finished all the work three days ahead of the deadline.
(做得好！妳在期限三天前提早完成了所有的工作。)

9. sweat like a pig (phrase) (汗流浹背)

→ In summer, all the students are sweating like a pig in the classroom.
(在夏天，所有的學生待在教室裡面汗流浹背地上著課。)

10. open ground (n.) (露天空地)

→ All the kids are setting off the firecrackers on the open ground on the Chinese New Year.
(所有的孩子在新年假期時，在露天空地上放鞭炮。)

11. gigantic (adj.) (巨大的)

→ I saw a gigantic whale swimming past our ship and it might be even bigger than our ship!
(我看到一條巨大的鯨魚從我們的船邊游過，甚至比我們的船還大呢！)

12. generate (v.) (產生)

→ Our government keeps trying to discover and develop green ways to generate power.
(我們的政府一直不斷的尋找以及開發對環境友善的方式來發電。)

13. off-shore wind turbine (n.) (離岸風電機)

→ If you drive along the west coast of Taiwan, you will see many off-shore wind turbines standing in the sea, which might become a popular tourist attraction in the future.
(如果你沿著臺灣西海岸線開著車，你將會看到很多離岸風電機矗立在海面上，那裡很有可能成為未來受歡迎的觀光景點。)

14. advantage (n.) (優勢、優點)

→ We need to take advantage of the strong wind season to generate more power.
(我們需要把握住強風的優勢，來發出更多的電力。)

15. constant (adj.) (固定的、接連不斷的)

→ He is still in constant trouble with math even though he has been trying to fix the problems for a long while.
(他一遇到數學時，總是陷入麻煩，即使他已經花好長一段時間，不斷地嘗試著去修復這個問題。)

16. hill (n.) (山丘)

→ The view is so magnificent when you look over the city at the top of the hill.
(當你從山丘頂上往城市看時，風景是非常壯闊的。)

17. function (n.) (功能)

→ I have no idea about the function of the machine sitting in the back of the room.
(我對於在房間後方的那台機器的功能，真的是毫無頭緒。)

18. transport (v.) 運輸、運送

→ My job is to transport goods from one city to another.
(我的工作是将貨物從一個城市運送到另一個城市。)

19. shallow (adj.) (淺的、淺層的)

→ Kids are only allowed to play in the shallow water area.
(小朋友們只被允許在淺水區玩耍。)

20. distribute (v.) (分發、散發、分送)

→ We all try to distribute the love to the people we care and make the society warm.
(我們都試著將愛傳遞給周圍我們在乎的人們，讓整個社會溫暖起來。)