The Guardian

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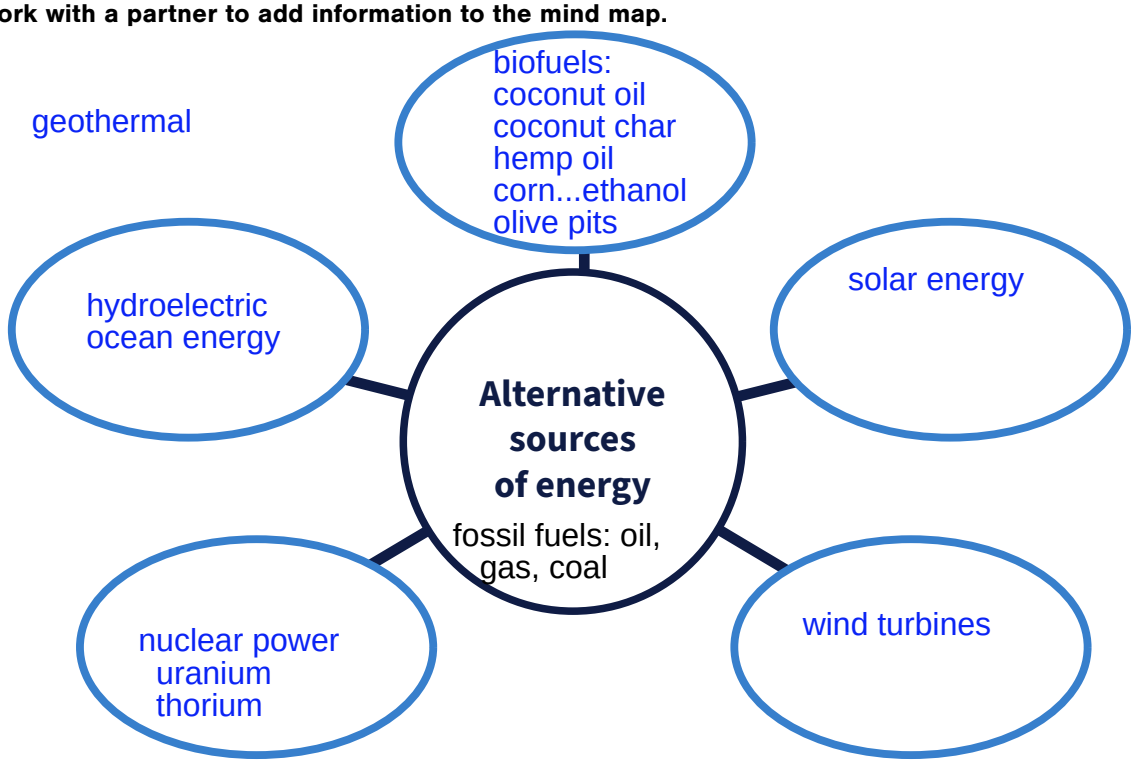
## How coconuts are starting to fuel parts of Papua New Guinea

**Level 3:** Advanced

## 1 Warmer

**a. Work with a partner to add information to the mind map.**




## 2 Key words

**a. Match the words below with their definitions. Then, find and highlight them in the article to rad them in context.**

1. backing i
2. blended n
3. cargo d
4. estate e
5. facility h
6. feasible o
7. flesh c
8. hectares g
9. lucrative b
10. roughly f
11. scale j

a. spreading over a large area
b. very profitable
c. soft part of a fruit or vegetable, especially when it is eaten
d. goods being transported from one place to another; freight
e. extensive area of land in the country, usually owned by an individual, family or organisation and used to generate income
f. approximately
g. unit used to measure land equivalent to 10,000 square metres
h. place including buildings and equipment where an activity is carried out
i. support, especially financial
j. size or level of something

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12. shredding l
13. squeeze m
14. stretching a
15. undeniable k

k. unquestionable, obviously true
l. cutting or tearing into small strips
m. press something firmly to change its shape, reduce its size or n. extract liquid from it
n. mixed, combined
o. possible to do, likely to happen

**b. Complete the sentences with words from the previous activity. You might have to change the form of the word.**

1. The desert landscape was vast, stretching as far as the eye could see.
2. They own a very lucrative business that operates in several countries.
3. They make roughly two million pounds a year.
4. Their new facilities are impressive and extremely modern.
5. The start-up was able to launch its innovative products thanks to substantial financial backing from several investors.
6. Experts proposed a pilot project to test the technology on a small scale before implementing it.
7. It is undeniable that this is a promising innovative idea.
8. The crisis forced the company to squeeze its budget and reduce spending.
9. She's taking a blended course - one F2F lesson a week and an online platform where she can practise whenever she wants.
10. I think implementing renewable energy solutions in our country is feasible and can lead to long-term sustainability.

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*Coconut biodiesel offers a cheaper alternative to fuel imports and scientists in the Pacific country are looking at how to use it more widely*

**Bethanie Harriman**
**10 May, 2024**

1 On Karkar Island in Papua New Guinea, hundreds of coconut trees stand tall, stretching far into the distance.

2 Decades ago, the fruit was a lucrative export, but over the years, it has become less prized on international markets. Now, the small island off the north coast of the country is putting coconuts to another use.

3 The oil from copra – the white flesh from the coconut – is used to produce biodiesel, a renewable fuel made from biological sources, such as vegetable oils or animal fats. On Karkar, that fuel is helping to power schools, hospitals and cargo ships.

4 It is made at the Kulili Plantation, a large estate with roughly 980 hectares filled with coconut trees and cocoa plants that spread across the island. Derek Middleton, the Managing Director at Kulili, says they are producing 600,000 litres of coconut-based biofuel each year.

5 The project began in 2007, when Kulili developed a small facility to produce coconut biodiesel. Over the years, it has proved successful and the operation has been growing ever since. Middleton is now trying to secure backing to expand the project and increase production.

6 "The fuel is used on Karkar in government vehicles, ambulances, police cars, motor vehicles, ships, generators and our own business," says Middleton.

7 Other countries in the Pacific, including Vanuatu and Fiji, have developed similar, small-scale projects and conducted research into using coconut biodiesel as an alternative to traditional fuels, such as diesel.

8 In many instances, coconut biodiesel has replaced diesel in Karkar, and the fuel is sold cheaply to the island's people.

9 Now, the country's leading science institute, PNG University of Technology (Unitech), is researching how coconut biodiesel could be used more widely as an alternative fuel. In particular, they are exploring if it can be developed and used across Madang Province, where Karkar is located, especially in rural and remote communities.

10 Middleton says expanding the local industry would further reduce dependence on costly imports of fuels, but securing backing to grow the operation has proved challenging.

11 Economist Maholopa Laveil says that in Papua New Guinea, provided the investments are profitable and sustainable, development partners may be needed, and "the positive social impact would be undeniable."

12 Turning coconut into biodiesel has a history in Papua New Guinea – as well as Madang, it was used by revolutionary forces in Bougainville during the crisis in the 1980s and 1990s.

13 The process of making biodiesel involves breaking down coconut oil by first shredding high-quality copra, which is pushed through machines to squeeze out the oil. It is then mixed with lye and alcohol and goes through chemical processes to create the biofuel, Unitech says. The university says that, when used alone, biodiesel is a more environmentally friendly form of fuel.

14 "It's just diesel, but rather than using crude oil, we use coconut oil in the process of making it," says Middleton, adding that it can be used alone or blended with traditional fuels – without the need to modify engines.

15 Middleton says biodiesel has replaced about 50,000 litres of fuel each month, but about 25,000 litres of traditional fuel is still imported.

16 At present, all the coconuts used are sourced from Kulili. The plantations have been in the hands of the Australian-PNG Middleton family since the 1920s when William Middleton acquired it after his service in the First World War. Now, it is run

by his grandsons, Derek and Brett Middleton. Cocoa is the main export product and is also focused on growing the coconut biofuel operation.

17 Middleton says that with more funding, the project could see enough fuel produced to supply the rest of Madang Province – home to about 500,000 people. Kulili has approached the Madang government about expanding the project and says there has been some interest. The Madang authorities didn't respond to requests for comment.

18 Laveil says developing biofuels could bring benefits to the region, including the potential to employ more people, provided there are avenues for unskilled employment and training. He says, for Madang, the immediate benefits would be increased goods and services taxes if more people were employed in the sector.

19 The Kulili project could be an example for the region more broadly, Laveil says, describing it as a "good example of the transition to green energy, and a locally driven alternative, and hopefully a successful business model".

20 He says getting volume and quality to levels at which it may be exported could take years and significant investment, but with local government support it should be feasible.

21 "For the initial stages of the establishment of biofuel creation, not only coconuts but sugar and others, I see the fuel, if it meets industrial and regulatory standards, meeting domestic markets before it enters international markets," says Laveil.


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### 3 Comprehension check

**a. Are these sentences True (T) or False (F) according to the article? Correct any that are false.**

1. Coconuts have maintained their value over time. F
2. Coconut oil is already being used as a source of energy in Papua New Guinea. T sovereigns
3. The production of coconut biodiesel has slowed down recently. F
4. Middleton has already found investors for his project. F
5. Similar initiatives are now in place in other countries in the region. T
6. Coconut oil is currently not as accessible as diesel. F
7. Biodiesel is a less damaging alternative for the environment. T
8. Producing enough biodiesel to export is not a real possibility. F

### 4 Key language

**a. Complete the sentences from the text with the correct form of the word in brackets.**

1. Decades ago, the fruit was a _____ **(lucre)** export, but over the years, it has become less prized on international markets.
2. Over the years, it has proved _____ **(success)**, and the operation has been growing ever since.
3. In many instances, coconut biodiesel has replaced the use of diesel on Karkar and the fuel is sold _____ **(cheap)** to people on the island.
4. Middleton says expanding the local industry would further reduce dependence on _____ **(cost)** imports of fuels.
5. Economist Maholopa Laveil says that in Papua New Guinea, provided the investments are profitable and sustainable, development partners may be needed, and "the positive social impact would be _____ **(deny)**."
6. Turning coconuts into biodiesel has a history in Papua New Guinea. In addition to Madang, it was used by _____ **(revolution)** forces in Bougainville during the crisis in the 1980s and 1990s.
7. The Kulili project could be an example for the region more broadly, Laveil says, describing it as a "good example of the transition to green energy, and a locally driven alternative, and _____ (hope) a successful business model".

8. He says getting volume and quality to levels at which it may be exported could take years, and _____ **(signify)** investment, but with local government support, it should be feasible.
9. "For the initial stages of the establishment of biofuel creation, not only coconuts but sugar and others, I see the fuel, if it meets industrial and _____ **(regulation)** standards, meeting domestic markets before it enters international markets," says Laveil.

## 5 Discussion

**a. Discuss these statements.**

- 'Developing biofuels could bring benefits to the region, including the potential to employ more people, provided there are avenues for unskilled employment and training.'
- 'Getting volume and quality (of fuel) to levels at which it may be exported could take years and significant investment, but with local government support it should be feasible.'
- 'I see the fuel, if it meets industrial and regulatory standards, meeting domestic markets before it enters international markets.'

## 6 In your own words

**a. In pairs or small groups, do some online research and gather information about other innovative sources of renewable energy and prepare a presentation about one of these initiatives, its benefits and challenges.**

**b. Report your findings to the class.**