

### Switch On Episode 3: Developing on Coal Transcript

0:00:05.440

Scott Tinker: Nearly every developed country developed on coal. The UK, the US, Germany, China, and dozens of others used coal to power their industrial revolutions and later their electric grids. And coal still provides much if not most of their electricity. Today many developing nations are following a similar path, juggling the energy benefits of coal with its environmental impacts.

Vietnam is in the midst of a coal revolution. I went there to get a better understanding of the benefits and challenges for countries developing on coal.

There are nearly 3 billion people today who still live with little or no energy and what I want to know is how they'll finally get it.

So this is sort of what it was, that's the future.

0:01:15.120

David Mwaniki: That's the future.

0:01:16.560

[Music]

0:01:18.080

ST: I'm Scott Tinker and I study energy. Come with me around the world to meet people and communities as they 'Switch On.'

Vietnam began by developing a manufacturing economy as many countries have. My first stop was to visit Viet Than Ho, the CEO of Garco, one of Vietnam's largest clothing makers.

Wow! This is amazing! How many people work in your group?

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Viet Than Ho: Under our management group of Garco-10 group, we have 12,000 workers.

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ST: That's just...

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VTH: And every year we are making around 30 million units.

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ST: 30 million units!

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VTH: Which were for 66 countries.

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ST: 66 different countries?

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VTH: Yes, in the world.

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ST: I'm feeling a little underdressed with my field shirt. Do you think I might be able to pick out a new shirt?

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VTH: Why not? So maybe we should go to formalwear. Yeah, I think this one maybe.

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ST: This one?

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VTH: Yes! It's good? You can try this one.

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ST: I'll try it.

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VTH: Yeah, you can try it.

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ST: Alright.

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VTH: You are too big.

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ST: Right from the factory.

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VTH: Oh it fits your body.

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ST: It does?

VTH: Yeah.

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ST: You did good.

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A manufacturing economy requires two things. A large population eager for jobs, and a lot of energy to help them do their work.

With all these machines you use a lot of electricity. How much electricity do you use every month? Or what's your electric bill?

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VTH: Our main production costs, the first one is salary for the worker. The second one is fuel. Like coal, like oil.

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ST: Oh really?

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VTH: And the last one is the electricity

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ST: So if the costs of energy go up: electricity, oil, and coal, your production costs go up.

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VTH: Right.

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ST: Tell me a little bit about the manufacturing in Vietnam. How many other companies do what you do?

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VTH: For last year, garment and textile industry spent 36.1 billion US dollars.

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ST: 36 billion from the garments alone?

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VTH: yeah for the garment section.

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ST: Wow. So manufacturing and particularly garments is really critical to Vietnam's economy

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VTH: Yes

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ST: Very impressive.

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VTH: Thank you very much

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[Music]

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ST: Besides people and energy, a manufacturing economy requires shipping and ports to bring in raw materials and send out finished goods to the rest of the world. Both of which rely on diesel fuel. I went to one of North Vietnam's largest ports to meet their director.

This is awesome.

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Port Director: Yes. This is called a crane.

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PD: Yeah, a crane.

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ST: How many are in your port?

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PD: Totally we have 14.

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ST: 14. They're picking one up.

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PD: Yes, now they start loading the cargo on the ship.

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ST: Tell me a little bit about the people who work here. How many people work here and where do they come from?

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PD: We have more than 800

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ST: 800 people?

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PD: Yeah, 800.

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ST: Does the port run all the time?

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PD: Yeah, all the time. We have no holidays.

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ST: No holiday. That's a lot of employment. In terms of Vietnam's economy. How important has the growth in shipping been?

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PD: If we don't have a shipping line, we have no work because the shipping line they serve all the factories in the north of Vietnam.

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ST: Let's say if I were to come here 20 years ago. What would this look like?

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PD: Nothing here.

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ST: Nothing here? 20 years ago?

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PD: Yes.

0:05:21.440

ST: I mean, I can't see the end of it when I look that way. And I can't see the end of it that way.

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PD: Yeah.

0:05:28.240

ST: This has all been here in the last ten years.

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PD: Yes. Ten years.

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ST: You must use a lot of energy here.

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PD: We have so many equipment here, but before we use DSN energy. Now we mostly we changed to electric.

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ST: Mostly electric?

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PD: Yeah like RTGs and now they use electric.

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ST: These are electric?

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PD: Yes.

0:05:48.880

ST: How about the big cranes out on the porch?

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PD: Also.

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ST: So they're running on electric motors. So obviously energy prices affect your operation.

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PD: Yeah.

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ST: If the cost of energy went up a lot, you have a whole different business model.

To better understand the country's electricity needs, I went to talk to Binh Van Doan, Director of Vietnam's Institute for Energy.

The economy in Vietnam is growing very rapidly. It's a huge need for electricity.

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Binh Van Doan: Development of power energy plays a big and crucial role to economic growth of Vietnam. On average the growth rate of electricity consumption increased by 11% per year during the last 15 years. So during the last 7 years, for every year period the scale of electricity in Vietnam doubles.

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ST: To learn more about how Vietnam will meet its rapidly growing energy demands, I visited Hang Ngyuen, the Manager of Clean Air and Energy at Green ID. There's a lot of construction going on over here. In fact, there's a big jackhammer down here knocking things down.

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Hang Ngyuen: We are standing in front of a building and this is really a kind of typical image of Vietnam now with a lot of new construction.

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ST: Tell me a little bit about Green ID.

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NH: Green ID. Green Innovation and Development Center is a local NGO. We are working to promote sustainable energy development in Vietnam. In the past until now, hydropower is the main source. But from now until 2030 coal will be the main source, accounting for 40% in terms of capacity and more than 50% in terms of hcc generation.

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ST: Why is that? Why not keep hydro?

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HN: It's just because hydropower potential in Vietnam is just used up.

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ST: We've built all the dams that could be built, so you have to have something else.

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HN: Yeah, I think coal played an important role so far in our electrification process. Of course it provides power for the economy and for people. For more than 30 years, Vietnam has experience with coal power development. That means our human resources are familiar with coal, so it's easier for them to develop them in the future.

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ST: I went to meet some of these "human resources" miners and other coal industry workers and their families, who live in the mining towns of North Vietnam and support a large network of businesses and services. Hanoi journalist, Andy Nguyen joined me.

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Andy Nguyen: I was born in this province.

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ST: You were?

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AN: Yeah, in 1976. And I grew up in a small town exactly the same this town, and almost all families there have one, two or even three members working for coal mines or our port where they export coal to foreign countries. My father, my mother, my older brother, my sister-in-law, all of them are working for this industry.

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ST: It's the foundational income and it just makes the rest of town work.

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AN: The main benefits, the main income came from coal mine.

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ST: So if coal goes away, a lot of this economy goes away.

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AN: It will be a serious issue. I don't know, but it will be tough for the local people.

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ST: I went with Andy to one of the area's coal mines to get a closer look. How far do we go?

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AN: We will travel around two kilometers.

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ST: I was amazed by the sheer number of people going down into and coming out of the mine. Thousands of miners across three shifts, keeping the mine working 24-hours a day.

We're about 15 meters below sea level now.

Any nation developing on coal needs a large workforce like this that has experience or can be trained to do the job. They also need a lot of coal. And there are usable coal resources in many countries around the world. Those are called cleats, coal cleats.

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Speaker 1: Gold, black gold.

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ST: Wow, that's about as good as it gets. Pliable.

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AN: The coal here is high quality.

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ST: Yes, it is. Yes, it is. There it is. Alright. It's wet, it's a slurry. Yeah, that's pretty finely ground. How long has this mine been operating?

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S1: 68 years

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ST: How much does someone who works here make? What's their income?

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AN: On average more than 10 million per month.

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ST: Eight hour shifts. It's about two dollars an hour. Which would be fifty thousand. Fifty thousand per hour. So that's good living and that's steady work. Did your father work in this business?

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S1: Yes.

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ST: Yes. He did.

0:12:24.160

S1: My father, my grandfather also.

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ST: Really, so he's third generation.

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AN: For 15 years.

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My grandfather my father and now...

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ST: Here you are. Coal mining here and everywhere is hard work and can be dangerous, but in Vietnam, it's a highly regarded industry that has brought employment to tens of thousands of people. Coal that won't be used to generate electricity in this region, leaves the mines of North Vietnam by a rail network, which passes through the coal towns on the way of the coast. Here the coal will be moved from coal yards to barges, all also employing more workers.

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AN: This is a port where the ships come to transport the coal. This is his ship.

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ST: That's your ship?

Bye-bye. Alright, good luck.

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[Music]

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AN: The coal comes here from different coal mines and this port for transporting coal to different provinces.

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ST: They take it down the coast back to rivers onto trains and then to coal plants and make electricity.

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AN: Not only coal plants, cement, vitamins, different kind of factories, which need coal.

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ST: Here's one loaded and they cover it right down to two feet within the water line. Isn't that something?

Countries developing on coal will use a lot of it. Meaning it's vital to construct and maintain a large and wide-ranging coal transportation system like the one they've built here.

Back in Hanoi, I talked to energy analysts Ngo To Nhien and An Ha Truong,

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An Ha Truong: Any government who want to have energy development, they should balance between the three pillars: energy security, the energy equity, and the environmental sustainability. So we are doing quite well at the moment, but in the future the energy security might be a little bit threatened because of the limited resource. If we need to import coal, that could be a real challenge in the future.

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BVD: Presently, we need 60 million tons of coal each year. Vietnam can produce 45 million tons of coal and import 15 million tons. But in the future, Vietnam will need to import more coal and it would be roughly  $\frac{2}{3}$  of total coal demand for power generation.

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ST: So this coal I see is coming in on the conveyor. Where does it come from?

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AN: The coal comes from a coal mine four kilometers away from here. By the belt's system, four kilometers.

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ST: On the conveyor belt?

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AN: Yeah, open conveyor belt

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ST: This new power plant is burning local coal, but they plan to build 50 more just like it, which is what will turn Vietnam into a coal importer. And there are other challenges. So where are we now?

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AN: Master control room, the power plant.

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ST: And so these guys, they're basically measuring what? He's looking at the ash. And this guy is doing something different? Oh the water system. The cooling system. So everybody has a different job. Coal has many advantages. One of the challenges is just the air quality, the particulates and the ash. So how do we fix that?

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Speaker 2: There are two main challenges. The first is emission of SO<sub>2</sub>.

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AN: So we do. We are using limestone powder to burn with coal to reduce.

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ST: To get the sulfur.

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AN: And the ash. The second challenge is the ash. This is a conveyor system to transport ash from the power plant to this area to store the ash.

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ST: Is this all ash behind us?

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AN: 20 acres. Around 5 million cubic meters of ash.

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HN: At this moment, not in the past, but at this moment coal power has more disadvantages than advantages. We see that coal is a source of environmental pollution including- air pollution, water pollution, and also soil pollution. I had a chance to visit coal powered areas. And I witnessed impacts of coal dust in this area. It takes time for people to understand the risk.

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ST: Yes.

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HN: And when they understand the risk, it's too late.

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ST: I went to a town just downwind from the coal power plant to get their impressions of the local air pollution.

Does everybody you know have electricity?

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Speaker 3: Yes, of course. In Vietnam, we have it even in the mountains. We've had it since we were born.

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AN: Yes, of course. When I was born I had electricity, my family had electricity.

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ST: So you work in a business, the coal business, which is your life. And that business puts pollution. Do you see that as a conflict?

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AN: No, she works for a railway company.

0:18:32.880

ST: No, but these guys work in coal, and the whole community is based on coal. But it makes the environment... So how do you change that? There's some ideas here. What's going on?

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AN: The dust, the dust. It does not come from the coal mine.

0:18:50.160

ST: Yeah.

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AN: It comes from the thermal power plant.

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ST: From the plant?

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AN: Yeah, you see the white dust in the air?

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ST: In the U.S. on the coal plants, we have scrubbers that scrub this out before it goes up.

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S3: We have the technology, but the quality is not good.

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ST: It makes it more expensive. What are some of the other challenges in the community?

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Speaker 4: Except for poor air quality, it's perfect.

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ST: So you don't want you don't want coal to go away?

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S4: Coal is the life of the community so we cannot leave it immediately.

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ST: If Vietnam wanted to switch from coal what could they do instead? I talked to the local experts about electricity alternatives and their challenges.

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BVD: Although we consider coal to be the backbone of Vietnam energy industry, we also think about importing LNG to run gas power plants. The gas power plant can start and stop the generator very quickly, so it can balance the intermittency of renewable energies, which are unstable sources, such as solar and wind power, to ensure the power system can operate constantly. Vietnam has good potential to develop solar energy especially in the central region and south. However, one drawback of generating solar power is its demand for a large land area. Vietnam is a densely populated country, so land use is competitive with other kinds of production. Therefore, solar power development has certain limitations.

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ST: What do you think about the public perception? What do they think about the energy situation here?

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Ngo To Nhien: There are some people who have a good knowledge when they are talking about the environment and clean energy.

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ST: Yes.

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NTN: But most of the people in Vietnam, they want to have cheap.

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AHT: The consumers they are very sensitive to any change in the price of electricity. For example, when the government announced that the electricity price will be increased by 8%, for example, so people are taking up very quickly.

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ST: Right right

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BVD: We are aware that coal-fired power releases emissions such as CO<sub>2</sub> to the environment, which is an issue, not only in Vietnam, but all over the world. However, it's competitive in price compared to other sources of energy, other sources of power. Coal power costs about 6 to 7 cents per kilowatt hour. Solar power costs 9 to 10 cents. Wind power is about 11 to 12 cents. Gas power costs around 13 to 14 cents. Therefore, we made a decision based on the lowest margin cost, the most affordable is selected first.

0:22:18.080

ST: Coal is cheap and local, at least in the beginning, and provides millions of jobs, not just in the coal and power industries, but all the other industries that depend on it. Coal allows a country to lift itself out of poverty and increase the standard of living with all its citizens, often by making the affordable products that the rest of the world buys. But like all benefits these come at a cost- local pollution. And the global issue of CO<sub>2</sub> emissions. Because it's cheap and local and established, China, India, Vietnam and many other developing nations, mostly in Asia, plan to continue to expand their coal use in the coming decades. If developed nations want to help them reduce their air pollution and CO<sub>2</sub> emissions in our one shared atmosphere, we could help them develop on some other energy source. Coal alternatives that are more accessible, reliable, and affordable are topics for a future film.