

Be first to use FT.com's new prototype site. Opt in here (you can opt out at any time).

June 5, 2015 5:40 am

Estonia sees a bright future for oil shale

David Crouch

[Share](#) [Author alerts](#) [Print](#) [Clip](#) [Gift Article](#) [Comments](#)



Cutting edge: Eesti Energia's oil shale processing plant in Narva

It is like a vast geological sponge soaked in oil. But squeezing the energy out of kerogen shale, the poor relation in the shale oil boom, is dirty and expensive.

Now companies in Estonia, which for decades has relied on kerogen shale for the bulk of its energy needs, are seeking to persuade the world they have the keys to unlocking this energy source in new, clean and efficient ways.

Investment, research and high-technology industries

Kerogen shale is more commonly, and confusingly, known as oil shale. Suffused with kerogen — a precursor of oil — when



mined, crushed and heated to high temperatures the rock releases oil and gas. Shale oil, in contrast, is oil locked inside rock that can be released by drilling down and injecting high-pressure water, sand and chemicals. The oil obtained from kerogen shale is also known as shale oil.

Estonia is unique in its reliance on kerogen shale for energy. It sits on large deposits and is almost independent in energy — an important consideration for a young nation bordering oil-rich Russia. Estonia uses 85 per cent of the shale it mines to generate electricity, with most of the rest producing oil.

Hando Sutter, chief executive of Eesti Energia, Estonia’s largest power company, says: “We don’t have other energy resources, no hydro, oil or gas; so ever since our people found there is a rock you can burn, they have been innovative — we have been generating power from oil shale for almost 100 years.”

Now Eesti Energia — Enefit outside Estonia — is taking the first steps towards exporting the technology it has refined for decades. It expects to get the go-ahead this year from the government of Jordan to build a 540MW power station based on rock containing marine micro-organisms deposited 65m years ago. Jordan imports most of its energy, making its oil shale deposits a potentially valuable resource.

“This is the first major export — the investment is very big. I hope it is the first of many,” says Alar Konist, a senior researcher at Tallinn University of Technology.

There are oil shale deposits in more than 30 countries, with resources in place of about 5,000bn barrels of oil — more than estimated known reserves of oil recoverable by conventional methods. Mining has taken place in the US, China, Russia, Jordan, Brazil, Morocco and Estonia — in descending order of resource availability, according to the International Energy Agency — though Estonia has seen the most activity.

In 2011 Eesti Energia bought a large oil shale deposit in the US state of Utah, which the company believes contains 2.6bn barrels of recoverable oil. The US has 80 per cent of the world’s oil shale. The IEA estimates that an oil price of at least \$60 per barrel is required to make commercial exploitation of kerogen shale for oil production profitable.

We don’t have other energy resources. We have generated power from oil shale for 100 years

[Tweet this quote](#)

But there are strong environmental objections to kerogen shale, which produces high carbon dioxide emissions when used to generate power. Estonia’s per capita emissions are higher than Russia’s and twice those of Italy or Ukraine, though still lower than the US.

Keith Burnard, head of the Energy Supply Technology Unit at the IEA says: “Experience has shown that exploitation of oil shale, whether for oil production, power generation or

industrial use, is energy-intensive and CO₂-intensive.

“In Estonia, one might argue its use is positive for energy security and economic development — but it is certainly not positive for the environment.”

Estonia’s total CO₂ emissions have remained roughly stable over the past 20 years, although oil shale output has climbed, as the process of extracting energy has become more efficient. Now, Estonia says that further increases in efficiency will reduce energy-related CO₂ emissions to half the 2007 level by 2020.

Eesti Energia has been piloting a new generation of shale oil power plants, the first of which is planned to be commissioned at design capacity this year, with more than double efficiency compared with older plants. “Through cogeneration of oil, gas and power all at once, we can halve our CO₂ emissions,” says Mr Sutter.

French multinational [Alstom](#) is building a combined oil shale and biomass power plant for Eesti Energia in Narva, near the Russian border, designed to meet future stringent EU emissions targets. The €640m plant is the largest energy investment since Estonian independence. Its use of biofuels in place of some of the oil shale can lower the plant’s CO₂ emissions to levels similar to those of modern natural gas power stations, the company says.

Large amounts of ash remain after the oil separation process, but instead of being dumped it can be used in the cement industry, according to Dr Konist. “It is one of the key things when we talk about developing this technology,” he says, arguing that calculations of CO₂ emissions from oil shale do not take this into account.

Estonian company VKG is also developing a sideline in extracting phenols and other commercial chemicals from the shale oil or waste water used in older technologies, Dr Konist adds.

In collaboration with Finland’s Outotec, Eesti Energia is testing different kinds of oil shale around the world, to adjust its technology to local conditions.

“We are preparing for export,” Mr Sutter says. “We are introducing oil shale to the world.”

RELATED TOPICS

Shale Oil and Gas

 Share  Author alerts  Print  Clip  Gift Article

 Comments

Printed from: <http://www.ft.com/cms/s/0/778da826-fd66-11e4-9e96-00144feabdc0.html>

Print a single copy of this article for personal use. Contact us if you wish to print more to distribute to others.

