Asia Clean Energy Summit Byline Editorial

Hed: **Digitalisation will change the energy ecosystem**
Dek: Machine learning, blockchain and other new technologies hold the potential to alter the future of clean energy

As someone who works in clean energy and renewables, Mathias Steck thinks a lot about the future. But what excites him the most is the thought of any grid connected assets – from the power plant to home appliances, such as air conditioners and refrigerators, getting smarter and smarter.

"This will allow us to improve the efficiency of the energy ecosystem on entire system level, and it will even make our lives much more convenient at the same time. Home Appliances will be more naturally integrated into our lives without having us interact with them so often," says Steck, who leads the energy and renewables advisory section of DNV GL's Asia Pacific branch. "So in the future, maybe my air conditioner will know what temperature I like it to be at certain times of the week and when I am inside or outside of my apartment."

That would certainly give us a renewed quality of life, he says, but importantly smarter machines, enabled by new technologies such as machine learning, will help us optimise energy efficiency. It's an especially salient point, given that burning fossil fuels — to produce electricity and heat, and to power transportation — is the biggest source of greenhouse gas emissions in the world today.

People have no choice but to change and adapt the way they use energy, and Steck's company DNV GL, which advises firms on renewables, power and energy management, firmly believes the world will undergo a rapid energy transition — with digitalisation aiding that transformation. "It's an evolution but it's moving really fast," says Steck. "Many people are now looking at digitalisation as a massive disruptor. But it predominantly is a substantial opportunity."

During his talk at the upcoming Asia Clean Energy Summit later this month, Steck will explore how emerging technologies such as machine learning and big data will alter the industry. "I'm always trying to think about the transformation of the energy sector by disruptive technologies."

Blockchain is one such technology, having emerged in recent years to change the way firms from finance to healthcare operate. It's often described as a public ledger, where individual transactions are recorded in "blocks"..

The technology is employed partly already in banking, but Steck believes it can among others be used to help make energy consumers more environmentally aware. "Right now, as soon as an electron is produced, you don't know any more about its source — whether it's from a wind turbine or a nuclear plant," he says. "But you can actually label electrons with blockchain, so if you only wanted to use "green electrons", you could. Also, this technology will allow to cut intermediaries out and hence the cost of transactions will decrease massively which will allow for new use cases, such as providing a partial charge to an electric vehicle during the seconds it stops at a red traffic light."

But currently there are also implications for energy savings in the blockchain arena. Creating new blocks is still largely based on a principal called 'proof of work' where you have to crack very difficult math problems. Every time you crack it, you get a fraction of a certain cryptocurrency such as for example BitCoin," explains Steck. But creating these blocks, or "mining" them in industry lingo, requires vast amounts of computing power. Already today

the power required globally for this activity is equivalent to the energy needed to power an average American city of about 150,000 households.

The energy industry could hold part of the answer — to that and to other climate-related problems. "The energy industry, more than any other, has the power and knowledge to manage the world's carbon budget in a smarter way," says Ditlev Engel, DNV GL - Energy's CEO. In September, his firm released a report *Energy Transition Outlook: Renewables, Power and Energy Use*, which predicts that the overwhelming majority of global electricity production — or 72 percent — in 2050 will come from renewable sources. Solar energy will comprise more than a third of such clean energy.