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## Why those AC bills are hard to tame

2 messages

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# Green Margins

by **Seema Singh**

Wednesday, 03 August 2022

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Good Morning Krishna,

With the rains running their normal course, the unbroken pall of heat of the last few months already seems like a distant memory. But the cooling industry has also released a half-yearly report for 2022, and it's reported [record sales](#). Six million domestic air conditioners (ACs) were sold in India during the first six months of the year.

Electricity bills have soared, and this won't be a one-off event. We've already been [warned](#) that the growing demand for ACs is one of the most “critical blind spots” in today's energy debate. Chances are, if you are running a business, you already know this. I bet your ACs are burning a large hole in your pocket.

And starting this month, we also have new energy rating rules kicking in—which is especially relevant for commercial ACs. This means there'll be a higher bar for 5-star ratings, and existing 5-star ACs will automatically become 4-star, 4-star will be 3-star, and so on. India is pushing for higher energy efficiency and refrigerators' ratings are to be tweaked come January too. Brace up.

As I was researching this, however, I stumbled upon an interesting solution. An emerging technology that purportedly offers 30-40% energy savings but is facing a David vs Goliath fight in the Indian market, even with heavyweight early adopters such as Honda India, Mahindra & Mahindra, Adani Group, and Siemens.

It's served to refresh my memory on why energy transitions are not like consumer technology upgrades.

Let's dive in.

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## Chilling with the sun 🧊☀️

Today's ACs have come a long way since 1902, which was when a skilled engineer named Willis H Carrier invented modern cooling. He did it by experimenting with humidity control to solve problems like swelling paper and blurring prints at a printing facility in Brooklyn, New York.

There've been several advances in air conditioning since then—in the compression technology, diagnostics and controls, electronic sensors, materials, and steadily improving energy efficiency. But the fundamental science remains the same. It's the same principle

Carrier used: the compressor uses an enormous amount of energy to heat up the refrigeration gas running through copper pipes.

Over the years, AC manufacturers have complied with incremental energy efficiency demands from regulators. And every time the ratings get more stringent, efficiency improves a few percentage points. Nobody has really brought a disruptive technology to the table.

Until Tempe, Arizona-based SunTrac took a small step and invented a renewable energy technology specifically for ACs.

Put simply, it's a hybrid thermal solar AC system that uses the sun's heat to help the compressor use less energy.

The hybrid thermal solar (HTS) panel is basically a set of mirrored parabolic concentrators that track the sun and harness its energy. And a HTS panel, usually 8ftX4ft in size, is integrated into an AC's refrigeration cycle where it acts as the compressor booster.

I can't say if SunTrac faced the early Tesla-eque pushback from existing AC manufacturers in the US, or if it was an easy sell. Their website claims that each SunTrac unit is eligible for federal and state tax credits.

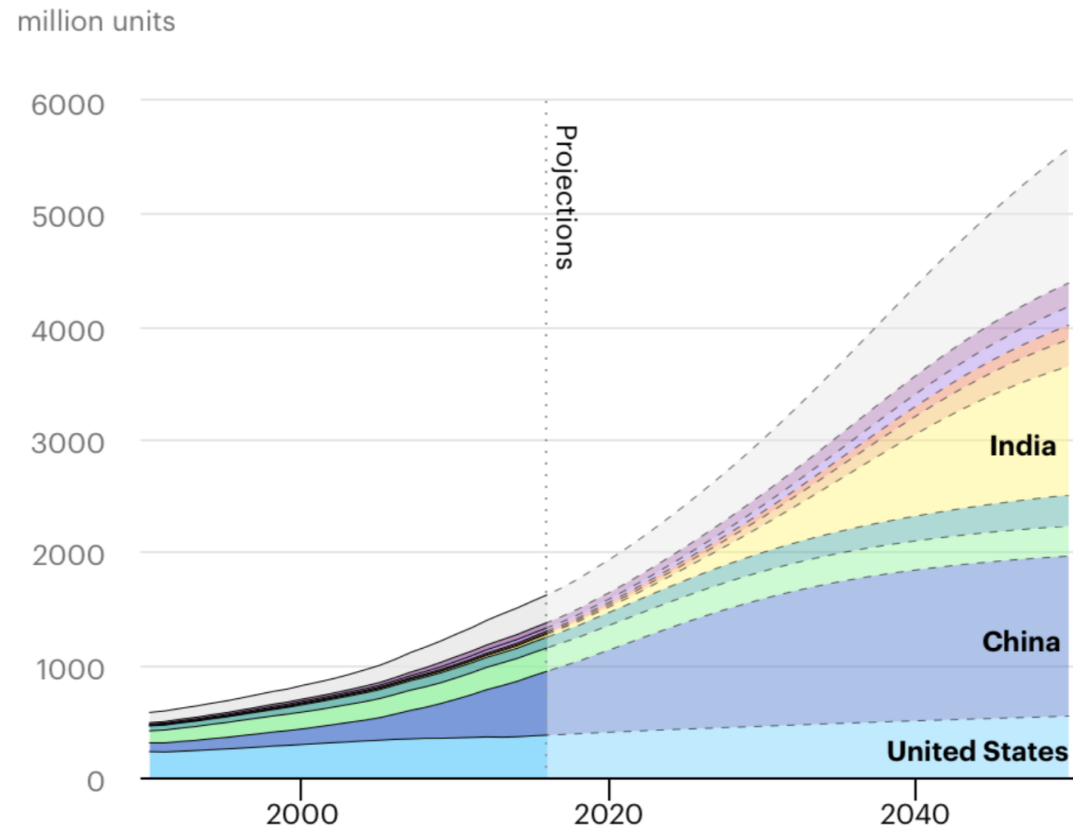
In India, though, the company which has an exclusive licence to sell this technology—Perfect Infraengineers—seems to be having a hard time. Not so much in convincing potential customers, but in getting AC market leaders on its side and having HTS panels integrated into their products.

Perfect Infraengineers promoter Krishna Mehta says the company makes 90% of the panel in-house in Thane; a few sensors and the controller technology from SunTrac are the only imported bits. Each panel can run an 8-10-ton AC and saves up to 30-40% in electricity consumption, he claims. (Several case reports from India claim the same.) A point to note is that HTS can support ACs only during the day—when the sun shines—and is meant mostly for commercial ACs.

It's found sizable demand—such as from Honda India, Siemens, the Adani Group's headquarters, Mahindra & Mahindra's Pune factory, and the state Legislative Assemblies in Mumbai and Raipur.

Yet, this isn't enough. Because India's AC market leaders like Daikin aren't convinced.

### Global air conditioner stock, 1990-2050



[Caption: By 2050, around two-thirds of the world's households could have an air conditioner. China, India, and Indonesia will together account for half of the total number. Source: IEA]

## **Save energy at your own peril**

For now, the government appears to be taking a lead in championing this technology.

They want green solutions and Perfect is ready to demonstrate the energy savings in real time. That's how they clinched the Mantralaya buy-in and were able to bid for the government tender in Maharashtra. And sign up customers such as the food company Bikanervala or the Adani Group. All of which saw the energy savings in real time and didn't ask for a Bureau of Energy Efficiency (BEE) rating. In any case, such a rating can't be obtained because HTS sits inside a product; it's not a product in itself.

Still, that's an inefficient way to popularise what seems to be an efficient technology.

Technically, and in an ideal world, Perfect would work with AC manufacturers to install and integrate its panels into ACs when they get sold. Or retrofit them in older ACs.

In the real world, though, original equipment manufacturers (OEMs) don't seem quite keen on supporting this technology.

I learnt—and I've reviewed a few documents—that some OEMs tell AC buyers that they would not supply spares under the annual maintenance contract (AMC) if an HTS panel was installed and integrated into their products.

When I asked Krishna if installing an HTS panel harms the AC in the short to medium term, and if that could be a reason for the non-cooperation, he told me his company would underwrite any such mishap or repair. "We give assurance in writing that we'd replace the AC at our cost if anything goes wrong and we have data to show that the technology works fine for years," he said.

As you read this, one of India's power sector PSUs is caught between Daikin and Perfect Infra. I came to know through Krishna that the latter's panels are lying on the rooftop, and the former's unwillingness to supply the spares has left the PSU in a limbo.

In response to *The Ken's* specific questions on Daikin not supporting HTS and refusing to supply spare parts, this is what the company had to say:



*As you know Daikin is a global leader in air-conditioning and we are always supportive of innovative and new technologies and we are always open to new initiatives which are for betterment of society at large; However, such new innovations takes time as it goes through a lot of steps. As a global company, we always believe in bringing new and safe technology regularly through our research and development.*

Maybe the new energy rating rules could help. Krishna couldn't hide his frustration (or happiness?) though: "When my HTS panel is installed in any AC, the efficiency is so high that literally all ACs will become 1-star."

Alas, BEE cannot rate this technology.

And the Quality Council's National Accreditation Board for Testing and Calibration Technologies (NABL) can't certify it either. Because...it's complicated.

The regular AC certifying labs are thermally sealed rooms and no one would make a hole in their structure and take a pipe to the rooftop to test the solar unit's performance. Krishna says Perfect is stuck between the NABL lab, which can't really test its tech, and doing real-time testing, where OEMs use the 'no spares' stick to discourage installation.

Only customers who are willing to take the onus of the ACs they've practically paid for and own will be its early adopters.

Nobody ever said energy transition is like upgrading your smartphone.

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That's all for this week. Do you have an air conditioning story to share? Do write in to [greenmargins@the-ken.com](mailto:greenmargins@the-ken.com), and I'll be in your inbox next Wednesday as usual.

Regards,

Seema Singh

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Beautifully written article Seema

Can't thank you enough for it

Hoping it reaches the right people

Regards,  
Krishna

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