

Raven-i

# The Unlikely Heroes of Tomorrow's Energy Revolution



# From Sewage to Streaming the Surprising Future of Waste Heat

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The smartest way to reduce our heating costs and emissions is by utilising industrial waste heat and other freely available heat. Harnessing these resources requires embedding excess heat capture into our urban planning - and building heat highways to feed our community heat networks.

## The Heat Is On—A Future of Energy at the Crossroads

The future of energy is poised on a precarious edge, where progress and demand clash in a race against time. As the world embraces the promise of renewable electricity, ramping up wind, solar, and other clean technologies, an insidious truth looms: our hunger for energy is growing faster than our capacity to produce it sustainably. The electrification of transport, heating, and industry—once hailed as the solution to our fossil fuel addiction—is rapidly turning renewable electricity into a scarce and coveted resource. In a world where every sector competes for a slice of the green energy pie, prices are set to rise, defying the optimistic vision of a cheaper, cleaner future. The era of abundant, affordable renewable energy may be more distant than we dared to imagine, leaving us to wonder if our reach has exceeded our grasp.

## Data Centres: The Energy Giants of the Digital Age

In this unfolding energy narrative, data centres stand as looming giants, quietly consuming vast quantities of electricity to fuel our digital world. As the backbone of the internet, these behemoths already devour nearly 2-4% of the world's total electricity, a staggering figure that is only set to rise. But the real shadow on the horizon is the emergence of AI-driven data centres, whose insatiable appetite for power dwarfs that of traditional facilities. An AI data centre can consume up to three times more electricity than its conventional counterpart, driven by the relentless demands of machine learning algorithms and data processing. Projections suggest that by 2040, data centres could claim as much as 20% of global electricity, pushing the limits of what our renewable grids can sustain. As the digital landscape expands and AI becomes ever more integral, the energy burden of these data centres threatens to become an unsolvable riddle in our quest for a sustainable future.



Farmers collect green lettuce plants growing in a hydroponic greenhouse (vertical farming).

## Waste Heat: Turning Data into a Sustainable Resource

Yet, even in the face of this daunting energy challenge, a glimmer of hope emerges from the very sources that threaten to overwhelm us. Data centres, those vast consumers of electricity, hold the potential to become unlikely allies in our journey towards a sustainable future. These facilities generate immense amounts of waste heat—an often-overlooked byproduct that could be harnessed, stored, and transported through innovative, energy-source agnostic heat transmission highways. Imagine a world where this captured heat, along with waste heat from other industries like sewage and wastewater treatment plants, is channelled directly into our homes and businesses, providing warmth in the coldest months without the need for additional energy generation..

## Sewage Treatment Plants: Flushing Out a New Revenue Stream

The implications of this are profound. Sewage and wastewater treatment plants, often regarded simply as essential services, could also become key players in this energy ecosystem. The sale of their waste heat would not only generate additional income for these industries but could also be reinvested to upgrade aging infrastructure and protect against sewage overflows, which are becoming increasingly common due to the extreme weather caused by climate change. In this way, these facilities could play a dual role: contributing to a sustainable energy future while simultaneously fortifying their resilience against the very challenges that climate change presents.

"If the projected demand in data centres and AI are met, all of the heat produced from data centres over the next 50-100 years may be sufficient to decarbonise heating, reboot agriculture and lead the way in carbon sequestration."

Mark Bjornsgaard, Founder and CEO Deep Green

### Innovative Heat Networks: From Data Centres to Vertical Farms

But the benefits don't stop there. This reclaimed heat could also support vertical farming, hydroponics, indoor orchards and on-land fisheries, driving the growth of fresh produce and sustainable seafood in controlled environments, locally grown and surrounding our urban centres. As these supersized district heat networks take shape, they will inevitably become the backbone of heat distribution in an increasingly electrified world. In this future, renewable electricity—so vital yet finite—will be freed up to create e-fuels, synthetic fertilizers, and e-plastics, fuelling industries while our homes and agriculture thrive on the energy that once went to waste. The very challenges that seem poised to overwhelm us today could, with ingenuity and foresight, become the cornerstones of a resilient and sustainable energy future.

### A Symbiotic Energy System: Community Wealth and Green Jobs

In this vision of the future, we see the emergence of a symbiotic and holistic energy system that transcends mere survival and fosters prosperity. By capturing and redistributing waste heat, we create new streams of communal wealth, particularly for regions on the outskirts of our bustling cities. These areas, once marginalized, become hubs of green job creation, where local economies thrive on the sale of heat and the maintenance of sustainable infrastructure. This new energy landscape also holds the promise of eliminating fuel poverty, ensuring that no one has to choose between warmth or other necessities.

### Cathedral Thinking: Planting the Seeds for a Sustainable Legacy

Moreover, a more reliable and secure supply of energy emerges, one that is rooted in local resources and ingenuity rather than vulnerable to the whims of foreign imports. Money that would have flowed abroad now stays within our communities, reinforcing local economies and fostering resilience. The environmental benefits are profound: a cleaner, healthier planet, where the air is purer, the water cleaner, and the land more bountiful for future generations.

This is cathedral thinking in its purest form—a long-term vision where the seeds we plant today will grow into a thriving ecosystem for those who come after us. By investing in this future, we are not just meeting our immediate needs but also building a legacy of sustainability, security, and prosperity that will benefit generations to come.







Future-proofing Heat. For Good.



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