Clean AI Meet Clean Energy

Unlocking the Potential of Ingenious Digital Power

Chris Henderson & Nicholas Parker

We are in our fifth decade as the closest of friends, sharing dreams, laughing uproariously, dipping paddles into water, and caring for each other and our families. Ethics, and a passionate desire for a more just, equitable and sustainable world have been a central feature for our friendship, imbued with creativity and intellectual curiosity.

This commentary is a fusion of each of our 4th generation pursuits in our elderhood. Clean AI for Nick, and Clean Energy for Chris. So, Clean AI, meet Clean Energy.

Most of us have a media-fueled view of AI being all about Chat GPT writing university essays or legal briefs, and of humans being replaced by robots. Let's shed some light on what AI really means.

In its simplicity, AI, or Artificial Intelligence is digital technology connected to the web accessing multi-dimensional information sources to provide answers to questions or manage systems with limited or no human involvement. AI employs high-powered processing power, and purpose-designed or general algorithms performing complex tasks such as reasoning, making decisions or solving codes utilizing processing codes to function.

A lot of this technology can be referred to as Generative AI which has a broad lens, focused on producing products or developing and managing systems, and doing it fast.

Nick and the Cleantech Venture Network (CVN) have done pioneering work with Predictive AI which is narrow: with technologies and systems targeting specific economic, environmental, and ecological needs that they have labeled Clean AI. Their groundbreaking baseline report 'Cleaning Up with AI' merits a deep dive. Find an overview here.

What are the similarities? And where lie the differences?

Both forms of AI have three essential attributes. Firstly, accessing and/or generating vast groupings of data, often from diversified and unconnected sources. Secondly, developing and designing algorithms that posit new data relationships, that can span an array of social and economic dimensions. Thirdly, raw computing power that our era now offers to produce information and systems that are highly utilitarian. This triad is often referred to as the AI Stack.

The differences are material, though. Generative or Broad AI casts a net sweeping all in its path and, sometimes, running roughshod over privacy concerns, data sovereignty and uncredited intellectual property. It would not be unwarranted to critique some Generative AI as bordering on theft.

Predictive or Narrow AI seeks to solve specific problems that have been vexing societies, offering analytical tools that we have been searching for.

The possibilities of Predictive or Narrow AI for clean energy and an electrification economy have strong appeal. It will be essential for the Clean Electricity Web as conceived by futurist Jeremy Rifkin which conceptually posited linking together millions of points of energy demand and supply to improve efficiency and performance 24/7. Find his explanation of the concept here. While human ingenuity will be the basis of

Nick Parker has pioneered sustainability ventures, funds and initiatives around the world for over three decades. He coined and developed the "cleantech" concept while launching Cleantech Group. Under his leadership the organization helped create a global innovation ecosystem, mobilized over $6B in private equity and convened thousands of decision-makers.

Nick Parker
Founder

▶ Watch *Cleaning Up with AI* from Cleantech Group to learn more.

Clean AI design for Clean Energy, Narrow AI technologies can operate at lightning speed, with layers of relationships that go above and beyond human functionality.

For an Electrification Economy, Clean AI builds on the advanced energy generation, grid management and end use systems that have become more and more powerful. In this sense, Clean AI for Clean Energy is both revolutionary and evolutionary creating an advanced energy web of neural networks that stitch together the pieces of 21st Century clean energy systems.

The CVN report highlighted four Energy and Power applications for Clean AI:
1) *Electricity Systems Control* increasing effectives of energy resources allocation
2) *Enhanced Forecasting Tools* to better accelerate discovery and predict demand
3) *Optimization of Energy Operations* improving process efficiency, and 4) *Rapid and Dynamic Measurement Platforms* to monitor and analyze data.

So where are we likely to go as Clean AI meets Clean Energy?

A. **A Fluid Mesh Grid:** Where digital Clean AI tools integrate millions of energy demand points in an economy with diversified supply sources on a real time basis. Substantively reducing the scale of electricity generating capacity with a more strategic, whole grid view of supply, analyzing power production and usage patterns, with low carbon targets. This will require massive infrastructure investment, new market mechanisms, and more secure privacy screens, cybersecurity, and data protection.

B. **Tightly Wired Together Utility Clubs:** Building on existing systems integration between, for example, the European or Canada/United States grids. Inevitably entailing upgraded non-compete agreements and open-source architecture along with new systems standards and protocols.

C. **Clean Energy AI Apps:** For specific industry sectors and power requirements introducing more democratic electricity decision making – putting information into the hands of industrial and residential consumers. Increasing broadband and wireless capacity makes that reality more likely, sooner.

We already have notable examples of Clean Energy AI in practice in the electricity sector. "Scotland-based provider SSE has found AI-powered energy forecasting to be extremely useful. It is using technology to "forecast energy usage at the distribution system operator level" and analyze "future energy demand at a local level" (source: ft.com here). It is Cleantech by design, that offers scalability and replicability with global applications potential.

Are there downsides to a Clean Energy AI future? Absolutely! Protecting privacy, respecting data sovereignty, and equitable access to information must be overriding values. In addition, the vast energy demands of AI infrastructure will strain power grids, potentially emit more carbon and, draw on resources such as water needed to cool data centers. These downsides are hugely significant and could confound our ability to utilize these technologies effectively. These risks though mostly relate to Generative, rather than Predictive AI.

There is also a very large elephant in the room – where and how will Clean Energy AI capital be sourced.

Well, it certainly looks like we'll have more to brainstorm about the next time our friendship paths cross.

TRANSFORMATIVE
ENERGY