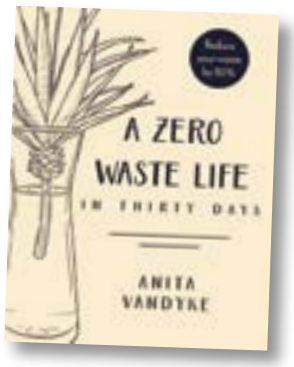
A Zero Waste Life in Thirty Days

By Anita Vandyke, Apollo Publishers, 2020, 178 pages, $17.99

Review by N.R. Mallery

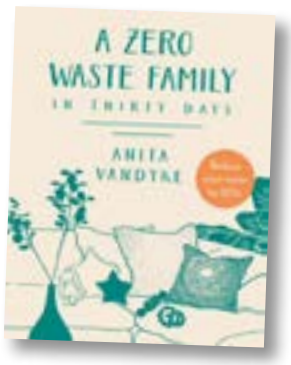


It is quite fitting to include this book review in this issue with our feature section about waste. Let's start with a review of the waste problem itself:

Waste is a problem related to climate change for several reasons:

1. Greenhouse gas emissions: Waste that is sent to landfills produces methane; a potent greenhouse gas that is more than 20 times as potent as carbon dioxide in terms of its impact on climate change. According to the Intergovernmental Panel on Climate Change (IPCC), landfills are responsible for approximately 5% of global greenhouse gas emissions.

2. Resource depletion: The production, transportation, and disposal of waste requires a significant amount of resources such as energy, water, and raw materials. As these resources become depleted, it becomes more difficult and expensive to produce goods and services, leading to increased prices and reduced access to basic necessities.



3. Habitat destruction: Landfills take up large amounts of space and can have a significant impact on natural habitats, leading to the destruction of ecosystems and loss of biodiversity.

4. Pollution: Improperly disposed waste can pollute waterways and soil, leading to harmful effects on human health and the environment. This can also contribute to climate change, as polluted environments can release more greenhouse gases.

Reducing waste and improving waste management practices can help to mitigate these impacts and reduce the overall impact of human activity on the climate.

In *A Zero Waste Life*, Vandyke has created a daily journal as a practical guide to reducing our waste impact on the world — reducing one's waste by 80%.

Starting with an audit of your recycling bins can be an eye-opening experience. Plastic waste, food waste, paper and cardboard, as well as cans and bottles of different materials are all parts of our waste stream. Reducing one's waste also has a considerable cost savings as well. The author also shows how it helps to create a clutter-free healthful living environment.

I encourage our readers to take a look at the book. It is not only beneficial to those just realizing the need to follow this path but is also helpful to those of us looking for additional ways to reduce our waste. You will find many helpful tips — even for those who may think they can't do any more.

This is one of two books by Anita Vandyke. She also offers a digital copy for the whole family called, *Zero Waste Family*. It is available online and also as an e-book.

The wood used to produce this book is from Forest Stewardship Council (FSC) certified forests, using recycled material or controlled wood sourcing and standards.

Interesting is the fact that the author is a qualified rocket scientist and is passionate about zero waste, minimalism, and all things related to green living. She was born in China, raised in Australia where she studied medicine and lives in San Francisco. Vandyke accredits her own journey to her family. She states "To my family, who taught me to not waste my life."

Read and learn more on her website at: www.anitavandyke.com. ♻

Letter from the Editor-publisher

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know for sure.) It turns out that used containers have to be put in the landfill if they are not rinsed well. The recycling facility does not have the time or means to clean these items. This all causes more work at the waste facility to put them on into the trash.

To get people to handle waste properly, they have to understand it better, which is really all about education. And that is what we attempt to achieve in *Green Energy Times*.

Of course, our waste stream goes far beyond food waste. Everything we do today seems to create waste. We live in a truly wasteful society.

Some people have concerns about the waste from solar panels and batteries. I question how this is so different from the waste from any electronic devices or gas fueled vehicles. Solar panels have a very long lifespan and it is still unclear how long they last. With no moving parts, what is to break? From my own experience with living off the grid with solar for 20 years, the original solar panels and all of the components are going strong without much loss in power production. There is also a re-use option for them should newer higher wattage solar options entice one to upgrade a system. And technologies for recycling silicon are just becoming available.

Utility and phone companies have used battery storage for a very long time. I know of off-grid homeowners who use discarded batteries and continue to use them. There is life left to most of these batteries long after they are replaced. EV batteries can be re-used for backup storage after they have been used in an EV. And new technology is being developed every day as R&D makes headway to create sustainability for re-use and recycling. We know we need to move away from the use of fossil fuels for so many reasons. Not to do so will only lead to a future that we will not be happy with, the same result as if we continue to resist change.

And that is why *G.E.T.* keeps bringing you ways to reduce your waste and our whole carbon footprint with every topic covered.

We hope that this and every edition of *G.E.T.* helps you understand the consequences of our waste stream. Our everyday lives can make Earth Day every day by taking the extra steps needed to help the future of our planet.

Happy Earth Day. Happy spring! – Nancy Rae. ♻

Turning Coal Waste into Energy Storage

Ohio University awarded $2 million from Department of Energy to develop products from coal waste

Coal waste pile west of Trevorton, Pennsylvania. (Wikimedia/Jakec)

The U.S. Department of Energy (DOE) has funded six research and development projects that will repurpose domestic coal resources for high-value graphitic products and carbon-metal composites that can be employed in clean energy technologies. Ohio University's Institute for Sustainable Energy and the Environment was awarded two of the six awards, one that explores how coal waste can be reimagined as energy storage and the second aims to develop ultra-conductive carbon metal composite wire for electric motors.

Turning coal waste into energy storage

The DOE awarded $999,976 to support the coal waste project, which will focus on developing electrochemical processes to convert coal-based materials to two-dimensional carbon materials for supercapacitor applications. The project is led by principal investigator John Staser, associate professor of chemical and biomolecular engineering. Additionally, OHIO faculty members Jason Trembly, professor of mechanical engineering and director of the Institute for Sustainable Energy and the Environment, and Damilola Daramola, assistant professor of chemical and biomolecular engineering, will support this project, alongside industry partners CFOAM LLC and Capacitech Energy.

Supercapacitors are typically used for energy storage. The project aims to develop advanced processes, called the electrochemical coal to two-dimensional materials (e-Coal2D) process, to transform coal-based materials into new materials that enhance the capacity of electrochemical supercapacitors. CFOAM, one of the industry collaborators, has developed coal-derived materials that are used as the raw material to generate the final product. Then, Capacitech Energy, a leader in cable-based capacitors, will evaluate the two-dimensional materials in their systems.

Coal's unique structure and composition make it well-suited for use as a raw material for producing various high-value carbon products. The ultimate goal of this project is to continue to find ways to reimagine coal waste to reduce greenhouse gas emissions and create jobs.

Understanding Ultra-Conductive Carbon Metal Composite Wire for Electric Motors

Led by principal investigator Yahya Al-Majali, assistant professor of mechanical engineering and assistant director of the Institute for Sustainable Energy and the Environment, this project aims to develop cost-effective carbon metal composites with enhanced bulk electrical properties for use in electric motors. This project was developed from a broader mission to increase American energy efficiency and reduce greenhouse gas emissions globally.

Using materials derived from coal waste, specifically nano-graphite and graphene, carbon metal composites will be created using novel metal forming processes. The performance of the finished material, which will take the form of an ultra-conductive wire, will then be tested and quantified to ensure readiness for real-world applications. The wire is intended to be used in electric motor applications, which further supports technology to ultimately reduce greenhouse gas emissions.

The award from the DOE totals $1 million with a $250,000 cost share. Industry partners include MetalKraft Technologies LLC, Fisk Alloy Inc., CONSOL Innovations, Hydro Precision Tubing North America, AmeriCarbon LLC, SP2 Carbon Technology Co and Clear Skies Consulting LLC. Additionally, a team of OHIO researchers will support this project, including Jason Trembly and David Drabold, distinguished professor of physics.

Development of the carbon metal composite wire will not only reimagine use for coal waste, but its application will offer key environmental and economic advantages. This technology will reduce carbon dioxide emissions, improve electric vehicle efficiency and create new manufacturing jobs for coal communities.

Introducing coal-derived graphitic carbons into electrical wire could significantly reduce American energy consumption, preventing up to 14 million tons of carbon dioxide emissions, and saving consumers $4.3 billion annually if just 20% of alternating current (AC) motors use ultra-conductive wire. Lastly, this technology will potentially create new manufacturing jobs for coal communities.

Ohio University is a student-centered, transformative learning community, where students realize their promise, faculty advance knowledge, staff achieve excellence, and alumni become global leaders. Ohio University is a Carnegie R1-classified research-intensive institution with a record of advancing knowledge through discovery and innovation in the natural and biomedical sciences, humanities and arts, and engineering. Visit www.ohio.edu/engineering/isee for more information. ♻

See Gallois SP2 Carbon USA's ad on p.40